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Communications and Cases.

OBSERVATIONS ON THE ANATOMY AND PHYSIOLOGY OF THE HORSE'S FOOT.

By George Fleming, M.R.C.V.S., Royal Engineers.

Physiology of the Horse's Foot.

(*Continued from* vol. xliv, p. 882.)

The observation of the facts referred to in the last paper has given rise to the axiom "That the secretory action of the coronary cushion may be diminished, and even entirely suspended, by a degree of pressure that acts as an obstacle to the excretion of the newly formed horn." In other words, an undue amount of pressure on any part of this cushion hinders the circulation of the blood in the secretory apparatus, and this, as a matter of course, brings about a proportionately diminished secretion.

And the inverse proposition, "That in diminishing the resistance opposed to the formation of new horny material, we favour and render more active the special function of the keratogenous apparatus," appears to be as correctly founded. As a proof of this, the effects following particular surgical operations have been adduced. For example, if a portion of the wall be removed from any point of the circumference of the hoof at the coronet, the new horn thrown out on the surface of the denuded cushion will in the course of a month have acquired such a thickness, in consequence of the suractivity of the generating membrane, that it constitutes a

[illegible]

salient tumour, projecting beyond the level of the other portions of the wall. No pressure or resistance having been exercised at this point, it would appear that the new material has been more rapidly and abundantly poured out. Another evidence in favour of this suractivity of the keratogenous function is afforded in the direction which the fibres entering into the composition of this tumour affect. Longer than the space between the surface from which they emerged and the commencement of the vascular laminæ over which they are to glide, these fibres have not the rectilinear direction of those in other parts of the wall, but describe an undulating curve outwards, and so adapt themselves to the short space in which they are enclosed. It is only at a later period, when they have become fairly associated with the horny laminæ produced at the lower margin of the coronary cushion, and are carried downwards by the ordinary movement excited by growth, that they assume a rectilinear form.

As pointed out also by M. Bouley, the practice of farriery furnishes additional proofs of the great activity of the coronary cushion on those points of its surface where the horn in process of formation meets with least resistance. Thus, the growth of the heels is stimulated by paring them very thin and applying to the foot what the farriers designate a "bar-shoe," which removes them from weight-bearing, and in this way diminishes the pressure transmitted to the corresponding parts of the cushion. By this means it is sometimes possible to obtain, in what is vulgarly known as "sandcrack" (a fissure extending longitudinally in the wall, generally penetrating to the living tissues), the formation of a continuous thick ring of horn, which in time takes the place of that which has become split; and it is also possible, by the methodical application of the same principles, to restore heels which have become too low or contracted to their proper height or normal diametrical development. It is also the same when the hoofs have grown so irregularly that one side, usually the inner, is higher than the other (or *à travers*, as the French veterinarians have it); by proper shoeing and adjustment of the hoof the weight may be thrown on those parts in which the growth of horn is most active, so as to lessen it; while the other region, which has sustained the undue amount of pressure that has caused it to suspend its secretion wholly or in part, may be so relieved as to resume its ordinary function again.

The influence of unequal pressure on the horn-producing apparatus of the coronary cushion is in like manner well illustrated in that deformity of the foot in which the whole

weight is thrown upon the front part of the hoof, and the lower portion of the limb knuckles forward, as it were (*pied rampin* of the French). At the toe, where the total weight of the limb is centred, the growth is exceedingly slow; but towards the heels, which do not reach the ground, the hoof is formed with very great rapidity.

Thus, then, the downward descent of the wall is effected in a uniform and regular manner from around the coronet, so long as the foot is maintained in a perfectly normal condition. But when this condition is disturbed or altered, it follows that the manner of growth must undergo a change, the secretion becoming increased or retarded, according to circumstances, and the horny case irregularly developed—a condition which is usually manifested on its surface by the unequal width at different points of a zone of horn having the same origin from the coronary cushion. A knowledge of this fact is of great moment and utility in the management of the horse's foot, and more especially in the operations of farriery. For, as insisted upon by the same talented professor so often quoted from—M. Bouley—one of the first rules of the farrier's art is to know, on the one hand, how to preserve to the hoof those conditions on which its regular form depends, and by proper shoeing to maintain the just disposition of the limb and foot; and on the other hand, by the intelligence of the artisan, to provide for any possible inequality in the keratogenous function, by preventing a too exuberant growth at one point, or stimulating another to greater activity.

So long as the weight of the limb and body is fairly distributed around the circumference of the foot, the wall of the hoof increases to the same extent throughout; but whenever the equilibrium is disturbed—so soon as one portion sustains more weight and strain than another—the form of the horny covering is notably and unfavorably affected. A knowledge of this fact aids us very materially in accounting for various deformities in this region, and devising measures to obviate or remedy them; and so fully confirmed is it by daily experience that a new aphorism, which the farrier would do well to remember, may be formulated to the effect "That, beyond the normal conditions of support, the growth of horn in the different regions of the hoof is in an inverse ratio to the degree of pressure to which they are subjected."

The farrier has, therefore, the power, to a large extent, to hasten or retard the growth of the hoof by the manner in which he distributes the pressure around the coronary cushion, or, in other words, by leaving one part higher than another. And there is also a maxim in farriery, that "the

more a hoof is pared the faster it grows," which, though containing a little truth, is derived from imperfect observation, and when applied in all its force is certain to produce most mischievous effects. It is certain that when a hoof becomes excessively long its rate of growth is diminished, probably because the foot is imperfectly exercised, and the circulation in the coronary cushion is less active. The intervention of shoeing doubtless diminishes the resistance that an unnatural development of the hoof offers to its rapid growth, by periodically substituting a mechanical action for the constant deperdition it suffers in the unshod state. In proof of this, it may be observed that the dimensions a hoof which has been allowed to grow for twelve months may acquire without being worn or interfered with by instruments, is scarcely equivalent to twice its ordinary length, while the quantity of horn removed in twelve successive shoeings is very much more considerable than this length, as it only requires some six or seven months for a mark made at the top of the wall to arrive at its lower border: showing that the hoof has grown as much in six or seven months when relieved periodically of its excess of horn as it did in twelve when untouched.

Nothwithstanding these facts, it is also certain that the converse is much nearer the truth, and that "the more a hoof is pared the less it grows." This is easily comprehended when we call to mind its structure; how the upper part of each fibre is occupied by a tuft of blood-vessels engaged in furnishing the material from which the horn is formed, and that the newly generated horn is soft and moist. Removing the external hard, dry, protecting hoof exposes this soft elastic horn to desiccation—it loses its moisture and shrinks; each tube or fibre becomes lessened in diameter and presses on the vessels in its interior; these consequently decrease in calibre and only permit a greatly diminished flow of blood through them, and hence a partial suspension of the growth of these fibres. The evil effects of this removal of the external horn may be further increased by the morbid processes it induces in the capillary tufts, which may set up a reaction against the inflexible restraint imposed upon them by their constricted sheaths, and become congested, or even inflamed, and the horn, produced in infinitesimal quantity, be very defective in quality; while the vitality of the whole foot, which is insufficiently protected by its attenuated covering, is thereby compromised, and pain and defective nutrition in the organ are the precursors of disease and altered gait, leading sooner or later to the destruction of the animal.

These results are patent and visible everywhere. We can even trace the changes which take place from month to month, and observe the perfectly formed hoof, with its thick, beautifully polished wall, quite smooth or faintly marked by transverse parallel undulations equally wide from toe to heel, and its strong flaky sole and frog, gradually, or even rapidly, converted into a small, contracted, unsightly mass, with a thin, dry, brittle wall destitute of polish, split and chipped around its lower margin, and perhaps covered with powdery scales towards the coronet; the sole thin as paper, as hard as flint, and quite hot and sensitive; and the frog, diseased and wasted, almost lost to sight between the shrivelled-together heels.

The effects of unequal pressure on the coronary cushion also demonstrate the imperative necessity for maintaining the foot perfectly *aplomb* in shoeing—reducing both sides of the wall to the same length—and attaching a shoe equally thick in both its branches. Upon the observance of this measure depends, to a great extent, the preservation or destruction of the natural shape of the hoof; its neglect tends incessantly to prevent the secretion of horn, and in time brings about the displacement and atrophy of the coronary cushion; for owing to one side of the foot being allowed to remain higher than the other, the cushion has to sustain undue compression in the portion corresponding to the lowest side; it is displaced, distorted, and becomes emaciated, is slow to produce horn, and the wall secreted by it is thin, incurvated, and generally faulty in its texture; at the same time the side bearing least weight supplies a superabundance of horn, expands, and thus increases the deformity of the organ.

From this, observes M. Goyau, it will be seen that the influence of the volume and direction of the coronary cushion on the form of the hoof is of capital importance. The hoof is normal when this cushion is voluminous, regular, and rectilinear; it is defective, on the contrary, when the cushion is emaciated, irregular, and incurvated. The deformation of the cushion precedes and governs the deformities of the hoof. For it would appear to be well established that the thickness of the wall depends upon the projection of this cushion beyond the plane of the vascular laminæ. Consequently it should be largest around the front of the foot and at the heels than elsewhere. Thus, the wall is thinnest when it is vertical, thicker when it has its natural inclination, and attains its greatest thickness when it is developed perpendicularly to the custion. The horn is secreted parallel to the direction of the laminæ, and, therefore, this secretion is

more or less oblique to the cushion in the different regions of the foot, and in certain defects or maladies of the organ. So that it may be admitted, in principle, that the thickness of the wall increases in proportion as the cushion is in a position to secrete the horny fibres perpendicularly to its surface; and that the wall has for its limit of thickness the projection of the coronet, which is parallel to the laminæ. So far from its being the case that the thickness of this part of the hoof is equal to the width of the cushion, but depends on its *projection*, it may be remarked that in the young foal the cushion is very wide in front when compared with that of the adult, and yet the wall is very thin in this region.

In addition to those above mentioned, we must not forget that other circumstances exist which may influence very materially the horn-producing function, and endow it with more or less activity. These influences, it appears, can be ranged in three categories, according as they may exert their action—1, on the entire organism, and indirectly on this function; 2, in a manner less general and more direction the whole of the feet at the same time; 3, or on a single foot, and even on a circumscribed region of it.

But, again, we have to remember that these influences do not operate to the same degree in every animal, for the simple reason that the secretory function does not possess the same activity in all; great variations being observable, not only in different breeds, but also between animals of the same race, according to individual dispositions and certain determinate conditions of structure, the recognition of which is important.

In well-bred horses, in general, for example, the horn composing the hoof is denser, tougher, thicker, more polished on its surface, and finer in texture than in coarser bred animals; it is also better fitted to resist the effects of external agencies, and is regenerated with greater rapidity, as has been pointed out by M. Reynal.

Among individuals, the variations in the rapidity with which the horn is generated are numerous and striking. There are some horses whose hoofs grow so slowly that from one shoeing to another there is scarcely enough horn formed to allow the new shoes a fresh bed, or the nails a hold in sound material; while there are others in which the production of this material is so active that in less than a month the hoofs have far exceeded their normal length, and require to be deprived of their excess by the tools of the farrier. Though it is not always easy to indicate the external signs which would lead one to prognosticate with certainty that the hoofs of one horse would grow rapidly and soundly, and

those of another scarcely at all, yet it will generally be found that the first has a well-formed hoof, justly proportioned in size to the volume of the body, and inclined in a normal direction around its superficies, with the horn of the wall thick, polished, even on its surface, and of a dark colour, the heels well developed, a firm prominent frog, the bars sloping in a regular manner, and the lacunæ deep and sharply defined; while in the second will be usually noted a hoof composed of thin, light-coloured horn, and too large for body and limb, the sole flat, heels low and weak, frog big, spongy and prominent, the wall uneven and ridged, destitute of polish, and inclined in a more or less horizontal direction. It has also been recognised that the abundance and rapidity of the hoof-growth is in relation to the thickness of the derm, the quantity of hair covering it, and the amount of colouring pigment distributed in its texture. So it is that, in general, horses with close-set, thick, tufty hair have the coronet salient and wide—an indication that the coronary cushion is amply developed—and the wall of the hoof is strong, and grows quickly; but those which have a thin fine skin, scantily covered by silky hair, show only a feebly prominent coronet and a thin wall. It is not uncommon to see light chestnut and white horses with thin-walled hoofs, but we usually expect to find them thick and strong in bay and other dark-coloured animals. Of course, exceptions will be met with, but as a rule it will be found that the above observotions are well supported by everyday experience, and that there is likewise a correlation between the hairs themselves and the horn-fibres—the coarser the hair the thicker the fibre. We have already explained why, in all probability, black hoofs should be stronger and more durable than white ones; possibly the same cause—the presence of pigment granules—may also serve to explain why the skin in proximity to the hoof should be less susceptible to disease when dark than when light coloured.

Several other influences, besides those enumerated, are at work in modifying, accelerating, or retarding the growth of the hoof, and some of these have been succinctly indicated by M. Bouley, while others would appear to have been overlooked by him. The most general, perhaps, is that arising from the quantity and quality of the food the animal receives. When horses have experienced privations for some considerable period, and subsequently receive a substantial ration, in a few weeks afterwards there may be observed a salient ring formed at the origin of the wall, a circumstance that sufficiently testifies to the increased activity of the horn-produc-

ing function of the skin at this part. In ordinary conditions this exalted activity is productive of no evil result; but when it chances to occur very suddenly, in consequence of a too-nutritive alimentation, it gives rise to disease. For instance, when wheat, or barley, or any other very alible grain, is given in undue quantity, acute laminitis not unfrequently ensues.* Indeed, from pathological observation there often appears to be a close sympathy in this respect between the mucous membrane lining the alimentary canal, the skin, and the membranes of the foot.

(*To be continued.*)

NOTE ON THE DIGESTION OF MINERAL SUBSTANCES.

By Richard V. Tuson, F.C.S., Professor of Chemistry at the Royal Veterinary College.

Physiologists and chemists have hitherto entertained the belief that the principal if not the sole function of the pepsin and acid contained in the gastric juice is to render soluble the albumenoid constituents of food, and thus prepare them for the subsequent process of absorption.

Conceiving, however, that it would be extremely interesting to study the effect, if any, of the solvent constituents of the gastric juice upon substances, especially those employed as medicines, I have set myself the task of investigating this subject. The inquiry is as yet but in its infancy, nevertheless the results already obtained are sufficiently positive and striking to induce me to "claim date" by placing on record the following experiments:

Experiment 1.—A mixture of calomel † and distilled water containing 2 per cent. of hydrochloric acid.

Experiment 2.—A mixture of calomel, pepsin,‡ and distilled water.

Experiment 3.—A mixture of calomel, pepsin, and distilled water containing 2 per cent. of hydrochloric acid.

These mixtures were placed in glass vessels, and kept at 38° C. (100·2° F.), *i.e.* about the temperature of the body, for twenty-four hours, during which time they were occasionally stirred or shaken. They were then thrown on to filters

* During the recent siege of Paris, numerous cases of laminitis were observed; they were due to the use of barley as forage.

† The calomel employed in all the experiments was previously tested as to its purity.

‡ *Pepsina porci* prepared by Messrs. Bullock and Reynolds.

of Swedish paper, and the filtrates saturated with hydrosulphuric acid.

The filtrate from Experiment 1 remained unaltered.

" " 2 " "

" " 3 yielded a black precipitate of sulphide of mercury.

The results of these experiments, therefore, show that neither dilute hydrochloric acid (2 per cent.) nor pepsin alone is capable of dissolving calomel, but that when these agents are mixed they do effect its solution, and consequently, that the digestion of calomel, so far as its solution in artificial gastric juice is concerned, is brought about under the same conditions as that of the albumenoids.

The importance of this observation will become apparent when it is borne in mind that it offers an additional explanation to those already published of the manner in which calomel enters the circulation, in order that it may exercise the many therapeutic actions with which it is accredited.

Whether or not oxide of antimony, sulphide of antimony, and other so-called insoluble remedies are dissolved by pepsin and dilute acid, is a problem which yet remains to be solved.

The influence of different acids, the chemical characters of the dissolved mineral and its behaviour when subjected to dialysis, and the action, if any, of peptones on inorganic bodies, have also to be determined, but these matters, together with many others, will form the subject of future communications.

"ON UNPROFITABLE DETAILS."

By D. B. Howell, M.R.C.V.S., Reading.

The Smithfield Club Cattle Show has come and gone, and the profession been favoured in the *Veterinarian* with the rules and regulations to be observed by exhibitors; but what advantage its publication was to us, I cannot see, unless to show the peculiar way Orders of Council are concocted. That to which I specially refer is the regulation about the removal of animals from the show, viz. Section 6, Clause 2, which enacts that "The animals not so affected may be moved and dealt with as if a case of foot-and-mouth disease had not occurred in the show."

Is this at all in keeping with the regulations ordered for

the country? In the country very stringent rules exist, even if they are not carried out, with regard to the removal of cattle, not only for a stated time after the outbreak, but even not until authority to do so has been given by Mr. Inspector, who may, perhaps, be Mr. Inefficient, notwithstanding all of which precautions foot-and-mouth disease continues to be very prevalent in this country. The LEADER in the *Veterinarian* for October states, that "in many districts the provisions of the Contagious Diseases (Animals) Act are wofully misapplied, in others they are almost totally neglected, while in not a few they are strained to a point which makes them so vexatious as to lead to every kind of evasion." And again, "In the first place, the disease is highly infectious, and its period of incubation short, and next to nothing is done to prevent the malady." With such an Order as that quoted above, and passed to meet a local requirement, what is there in the general regulations to induce stock-owners to confine themselves to the strict letter of the law? Rather; with such a precedent as Section 6, may we not say that they are encouraged to try every evasion, on the principle of looking out for the interest of self, and leaving others to do as they can? There is no doubt the disease is both contagious and infectious, and the period of incubation short; therefore, with all due deference to the Inspectors at the show, if foot-and-mouth disease manifested itself during the time the exhibition lasted, not a single animal should have been allowed to leave the metropolis alive, as in so doing centres of affection would be spread far and wide. Proofs of this are given by the reports in the daily papers of the list of purchasers of the animals exhibited, from most of the principal towns in England. That this view is correct is fully proved also by the well-known fact that animals communicate the disease to others even with a broad stream of water running between the pastures in which they are respectively placed, and without any possible means of the malady being communicated by direct contact. How much more, then, must animals which may probably have seen only their feeders or food suppliers for many months, and which are suddenly transferred to the turmoil of a crowded London exhibition, with its attendant vitiated atmosphere and inconveniences, in addition to the excitement of transit by rail, be susceptible to the morbid action of the contagion, and be likely to be passed before the malady has had time to manifest itself, even if subjected to the keen eye of an experienced Inspector?

If the precautions taken in London were considered to be sufficient to prevent the extension of the malady, why has not

the same courtesy been extended to Ireland by a special Order of Council? The *Veterinarian* for December states "that the Royal Dublin Society has resolved not to hold its usual winter show of fat stock at Christmas, in consequence of the continuance of foot-and-mouth disease in cattle, and the restrictions which the Privy Council have thought it right to impose, with a view to prevent the spread of contagion.

Without wishing to dictate in the least degree to the Editors of the *Veterinarian*, I would mention that too often valuable matter would seem to be pushed aside or crowded out of the journal, and a grievance inflicted on the reader by the issue of double numbers, caused by the publication of details of no possible advantage to the profession—such as giving *verbatim* the Order of Council, the origin of these remarks, or furnishing in full the names and addresses of exhibitors and breeders, amount of prizes, and age of every animal exhibited in the Royal Agricultural Society's show. On referring to back volumes of the *Veterinarian*, I find that in 1861 we were favoured with sixteen pages of small print—however, with plenty of intermarginal space—of names of exhibitors, &c., at the Leeds Show, and so on from year to year, more or less, until 1871, when we get sixteen pages of small type, with the intermarginal spaces crowded out, in the long list of names of exhibitors, &c., at Wolverhampton. What advantage is it to be handed down to posterity—and I sincerely hope the *Veterinarian* will be handed down from father to son, and preserved as a book of reference until the end of time—that in such a year Lord Brown's heifer gained the first prize, or that Lady White's boar pig was highly commended? I would not for a moment wish to strike out the report of the Royal Agricultural Society's meetings, especially when I remember the obligation the veterinary profession is under to the society, but I do object to details of names of exhibitors, &c. Notwithstanding what I have said I should be always pleased with a double number, even if every month, provided we obtained value for the increased charge in something really scientific and useful.

[We have given Mr. Howell's strictures in full, that our readers may see that he too has much to learn with regard to Government regulations as the measures of an Executive. Did he possess this knowledge we should not find him writing as if the inspectors of the show were the framers of Orders of Council, and responsible also for their provisions; nor would he be found to speak of the Privy Council as if it was common to both Great Britain and Ireland. Mr.

Howell ought to have known that the Privy Council of Ireland is as distinct from that of Great Britain as the two countries are, and that each can make just such regulations as it sees fit for adoption by the local authority.

Many veterinary surgeons seem to write and speak of Orders of Council as if they should be framed to meet their professional views only of what is right or wrong, forgetting that a Government has to consider general interests as far as possible in any Order it is empowered by law to make. We confess to the bad working of the Contagious Diseases (Animals) Act, more especially in the case of foot-and-mouth disease, but the fault rests with the local authority, and not with the chief executive.

With regard to the other point raised, that of the publication of the names of exhibitors and award of prizes at the meetings of the Royal Agricultural Society, we have only to state that these details are given for the very reason which Mr. Howell assigns, viz. that the *Veterinarian* is a work to be handed down from father to son. Thus, we have spared no pains to make it one of future reference. Its readers and supporters are not veterinary surgeons only, but agriculturists and stock-owners, and it is well for the profession that it is so, or the progress in veterinary science would be much slower than would be desirable.]—Eds.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from* vol. xliv, p. 890.)

In completion of our remarks upon the Dictyogens, we would now direct attention to two plants—the Sarsaparilla and the Herb Paris.

The different species of the genus Smilax are well known under the name of sarsaparilla, the latter name derived from the Spanish *Zarzaparilla* (from "zarza," a bramble; and "parilla," a vine), signifying a thorny vine.

This drug, though not used in veterinary practice, is yet so much employed in the human school that from two to three hundred thousand pounds of the rhizomata are imported in a single year, and so important is the so-called "root" considered that Dr. Pereira devotes no less than twenty-five pages of his 'Materia Medica' to an account of its descrip-

tion and uses, occupying no less than fifteen highly illustrative and artistic woodcuts in the delineation of its structure and the different forms met with in the market. The learned doctor describes no less than eight species, which we may shortly refer to in the following order:

1. *Smilax officinalis*, from Columbia and Guatemala.
2. *S. medica*, Mexico.
3. *S. papyracea*, Brazilian (also called Maranham, Para, or Lisbon) sarzæ.
4. *S. sarsaparilla*, United States of America.
5. *S. syphilitica*, New Granada.
6. *S. cordato-ovato*, probably not distinct from (5).
7. *S. perhampy*, Peru. Dr. Lindley thinks this identical with *S. officinalis*.
8. *S. obliquata*, Peruvian sarsaparilla of commerce.

Now, it is more than probable that these eight names do not really refer to distinct species; at the same time we must bear in mind that Professor Lindley, in his 'Vegetable Kingdom' states that the natural order *Smilaceæ*, including only the two genera *Smilax* and *Ripogonum*, includes no less than one hundred and twenty species, but it is more than probable that many synonyms have crept into the list; still, the perseverance with which every form of the genus Smilax has been canvassed can hardly be other than highly significant of the high esteem in which it has been held, or at least of the commercial importance of the matter.

Beck, in his 'United States Botany,' describes no less than eight species of Smilax—green briar; but he gives no account of their medical uses, though we know that sarza is much used in the States, and we import thence as many as twenty thousand pounds of the root annually.

In discussing the value of sarsaparilla we confess to no little difficulty in arriving at satisfactory conclusions, and especially when such an authority as Pereira says of it—"The relative therapeutical values of the different sorts of sarsaparilla are not easily determined. There are only two ways by which we can attempt to arrive at them—one chemical, the other clinical or empirical; but while, on the one hand, we have neither comparative analyses of the various commercial sorts of this root, nor an accurate knowledge of its active principle, so, on the other we have no clinical observations of the relative effects of the different sorts, and great difficulty exists in the way of making them, on account of the immediate and obvious effects of this root being very slight. To this absence of actual precise information must be ascribed

the different relative values assigned to the various sorts in different countries."

Pereira, too, points to the fact that while surgeons in this country have greatly extolled the root, physicians, on the other hand, have not thought so highly of it; but this he explains by supposing that physicians have less to do with the cases in which sarza is employed than surgeons; at the same time it is not at all unlikely that a medicine taken in such quantities as the compound decoction of sarsaparilla—called, indeed, a diet drink—may have been so done to the exclusion of less harmless drinks, or even medicines, and thus have proved to be beneficial by at least not opposing nature, if not by assisting her.

We shall not here attempt to describe the diseases in which this drug is given, but be content with saying that it is usually made to follow most active if not poisonous medicines, after which the mind, and through it the body, ought at least to get an improved tone, from taking a harmless and salutary diet drink.

The herb Paris belongs to the natural order *Trilliaceæ*, in which are four genera and thirty species; the *Paris quadrifolia* being our only British example. The *Mediola* and *Trilliums* of North America, of which latter there are no less than nine species, are said to possess violent emetic and diuretic properties.

The herb Paris of our woods is a handsome plant of curious aspect, remarkable for the possession of four or sometimes five perianth leaves, but no root leaves. There can be little doubt but that it possesses highly active properties in all its parts. Dr. Syme says of it—"The leaves and berries of this plant are said to partake of the properties of opium. The juice of the berries has been used as an ophthalmic. Linnæus says the roots are useful as an emetic, and are equal to ipecacuanha in this respect."

In concluding our remarks on these plants, it would seem that some of the group are not without medicinal properties; but until we can determine by accurate analyses the nature of their active principles, we shall have no fixed data for concluding as to their medicinal powers or their relative value.

ON VAPID OR UNRIPE FOOD.

By the Same.

As it is a general subject of complaint amongst farmers that the crops of 1871, though in some cases abundant, have not exercised that beneficial influence upon stock which they had expected, we purpose offering a few notes upon this important matter, with a view to explain the causes upon which this defalcation has depended.

Farmers all say that their stock have not *done* so well upon grass or hay or roots this year as usual, and they explain the matter by saying that "feed has not been proofy," or that it has been deficient in "proof," the simple meaning of which is that they have found from experience that, as they eannot observe their cattle to thrive so well upon an abundance as they have sometimes seen them do on a comparative scarcity, they conclude that the redundant herbage has been deficient in feeding qualities.

Now, as we all know how important is the influence exercised by sunshine and heat in ripening the different products of the earth, we may, perhaps, be right at starting in noting the fact that the past summer was remarkable for a low summer temperature, and a general dark, lowering, and moist atmosphere. Not that much rain fell at a time, but there was a general absence of dry sunshiny weather, and it was usually too dark, cold, and dismal to render the national game of cricket at all certain or agreeable.

These were just the conditions which favoured the growth of a heavy crop of grass, but not those to secure either a well-ripened or a well-made crop of hay, whilst the animals in the meadows got on but badly in the midst of freshness and abundance, the truth being, in as far as we could make out, that the condition of bitter extractive which in grasses proper precedes the conversion into saccharine matter was continuous, and saccharine matter was not formed, a fact which we think true with regard to straw of all kinds; add to this fact that the various aromatic principles dependent upon the formation of different essential oils, and which are only fully developed under conditions of heat and light, were very deficient, the result being that herbaceous food was vapid and watery, unripe, and, as the farmers would say, "*without proof*," and devoid of aroma.

In the previous year (1870), maize grew perfectly well, and ripened complete cobs on our farm. This year, under

the same treatment, not a single grain of Indian corn ripened with us.

We recollect, some years since, in a fine, hot, sunshiny summer, growing a large patch of Chinese sugar-cane (*Sorghum saccharatum*). It attained, in the open field, to the height of seven feet. At first its juices were bitter, and cattle did not relish it; soon, however, with the continuance of warm weather, the stem became remarkably sweet, so that we could enjoy the suction of a sugar-cane of our own tending, and cattle, like ourselves, were fond of the sweet food provided for them, and so we rashly concluded that the Chinese sugar-cane was a valuable addition to the soiling plants of the farm, and accordingly we tried it again the following year; but, alas! like 1871 as compared with 1870, the summer was cold and wet and dreary, and our cane, instead of attaining to the height of *seven feet*, scarcely in any case reached *seven inches*, and, in short, was a perfect failure; and so far from any indication in its flavour pointing to its name of sugar-cane, it was bitter and repulsive; and as we think the same changes take place in all grasses to a greater or less extent, we feel justified in concluding that, while the saccharine and aromatic principles attain their highest development in a fine season, they are scarcely, if at all, produced in uncongenial weather, and the result is not only unripeness and that fine qualities are not produced, but a positive medicinal flavour and effect from the prevalence of less agreeable constituents.

If we examine the roots of this year we shall find that they are for the most part larger and more succulent than usual. The monstrous mangold-wurzel and swedes of our shows have, perhaps, never been equalled; but since our flocks have been eating the turnips of this season diarrhœa has set in most virulently, and hundreds of sheep and lambs have fallen a sacrifice to the malady. All farmers concur in the opinion that these monstrous roots are deficient in feeding qualities, "*without proof*," and, as regards the "beet" varieties, it is an established fact that medium-sized roots contain the largest per-centage of sugar.

But, besides this, the quickly grown, watery roots never keep well; they soon rot, and we fear that this season will be very trying to the exposed turnip crop.

As regards fruits, it is notorious how badly ripened and how unwholesome they have been this year; store fruit will not keep, and in as far as our experience goes the best are deficient in flavour and quality. In our own garden the finest pears could not be got to ripen, and in consequence

some of them were degraded to the position of stewed pears; but, alas! even in this state they had no flavour. We think it is Alexander Dumas who, in one of his novels, makes the remark that "*there is no ripe fruit in England except baked apples;*" but even these, in the present year, are deficient in flavour and aroma, and the little cider that has been made will bear no comparison with that of the warm previous summer.

From these facts, then, we arrive at the conclusion that herbage, even in a temperate climate, requires heat and sunshine to ripen it, that it may develope all its qualities, and that this, being deficient herbage, will be poor in feeding qualities, or, as the farmer expresses it, will be "without proof."

We fancy the same facts would be arrived at as the result of a careful analysis of corn, for we hear on all hands that pulse and the cereals are very inferior to those of 1870.

RABIES AMONG THE ALBRIGHTON HOUNDS.

By F. Earl, M.R.C.V.S., Shifnal.

In Mr. Hill's criticism of my paper upon "Rabies," which appeared in the November number of the *Veterinarian*, I notice some mistakes, which, no doubt, have been inadvertently made, and therefore I may, perhaps, be allowed to set Mr. Hill right with regard to them. It is quite true, as Mr. Hill says, that the professional oversight of the Albrighton kennels rests with Mr. Cartwright and himself, as it is also true that no other veterinary surgeon had the opportunity of taking part in the *post-mortem* examination of the first two hounds which were attacked. It is not, however, correct that I had *no* opportunity of watching the symptoms exhibited by these animals during life.

It is well known to the majority of your readers that it is customary with veterinary surgeons, in the country, to send animals that may happen to die under their care to the kennels; just as gentlemen in a town would send them to the knacker's yard. Such being the case, and the Albrighton kennels being only a short distance from Shifnal, it can be readily understood that I sometimes have had occasion to attend there for the purpose of making a

post-mortem examination. I was thus engaged in investigating the nature of a case of chronic disease of the kidneys (the case is published in the June number of the *Veterinarian*) on the very day that the first hound was attacked, and, as such, I was requested by the huntsman to go to look at it. At that time the hound had a muzzle on; but even this constraint did not prevent it from dashing at the other hounds, and rolling them over like ninepins, in its attempt to bite them. Having elicited from the "first whip" that it was a most quarrelsome animal at all times, I advised the huntsman to separate it from the others, and watch it narrowly. I refrained, however, from giving any opinion of the case, for the very reason that Messrs. Cartwright and Hill had the medical supervision of the kennels.

Besides occasional visits for the above-named purpose, I often pass the kennels three or four times a day, and as I am well known to the huntsman and his subordinates, an opportunity is thus afforded me of seeing the hounds at any time. I think, therefore, that it is self-evident I did not gain my knowledge of the outbreak of rabies from mere hearsay.

Mr. Hill goes on to state that upon the third hound falling ill no time was lost in communicating to the master the fact that, in the opinion of Mr. Cartwright and himself, the disease was rabies, when it was at once decided that the pack should be destroyed. Now, there were originally twenty-nine couple of hounds in this pack, all of which, excepting the sixteen and a half couple which were destroyed in November, had, at different periods, either succumbed to the disease, or been knocked on the head as being incurable; and even as late as my first communication to the *Veterinarian*, although I strongly affirmed to the master that the disease was rabies, and urged upon him the necessity of taking the utmost precautions, I could not bring him to my way of thinking. He nevertheless thanked me for the interest I had taken in the matter.

I am sorry that the object of my letter should have been misconstrued, as I certainly had no intention to censure any one; and as Messrs. Cartwright and Hill have fully confirmed my opinion of the disease being rabies, I should not have troubled you with this communication, save in the interests of the privilege of free discussion; for if we cannot ventilate our ideas without giving offence to one another, I fear, as Mr. Hill says, that the time is far distant when one professional man will look on others as his brethren and friends.

[We have considered it right to give Mr. Earl's reply to Mr. Hill's communication; but here the matter must end.

Neither gentleman disputes the fact of the existence of rabies among the hounds, and this is the chief point of interest with the profession and the public.—Eds.]

ANOTHER INSTANCE OF THE INCAPACITY OF THE POLICE AS VETERINARY INSPECTORS.

By the Same.

On the 14th of November, I was in the Shifnal "Smithfield," which is an auction sale for fat and store stock, when I noticed a number of pigs suffering from foot-and-mouth disease; and as the disease was becoming very prevalent about here, in consequence of affected animals having been removed from Bridgnorth fair along the public roads, I deemed it my duty to seek out the inspector—a policeman. This being done, I found, upon enquiry, that he had seen the pigs in question; and I, therefore, asked him his opinion respecting them, when he said that they only appeared to be cramped when lifted from the waggon in which they had been brought, and that he could not see anything else amiss with them. I told him they were suffering from foot-and-mouth disease; but he said he dare not take the responsibility of proceeding in the matter, unless I gave him a certificate to that effect. I did so, and my opinion was subsequently confirmed by Mr. Lawrence Copeland, V.S. The pigs were consequently seized; but, as they were fat animals from Ireland, they were allowed to be slaughtered forthwith by the owner. As a sequel, the owner, W. Bristol Davies, Wheaton Aston, was summoned before the magistrates on the 1st day of December, when the existence of the malady having been proved by Mr. Copeland and myself, he was fined £10, viz. £1 per head for each pig, and £1 15*s*. costs. As a police officer, the person spoken of is most efficient, knowing well how to perform his duties; but as an inspector, under the Contagious Diseases (Animals) Act, he is totally incapable of acting in a right or proper manner. How can it be otherwise with men who lack even the rudiments of professional knowledge?

REMARKS ON FOOT-AND-MOUTH DISEASE.

By a "Midland Counties Veterinary Surgeon."

In common with many members of the profession, I have been expecting to see, in the pages of the *Veterinarian*, a really scientific article on the origin of foot-and-mouth disease, and also a description of the various pathological changes which attend its progress or follow in its wake, having especial reference to the causes which either increase or lessen the virulent form it sometimes assumes. I have had a few cases in which that dreaded sequela, sloughing into the pedal joints, took place, and in every one of these the constitutional irritation ultimately led to a fatal termination.

Again, as to the legislative measures for its suppression; fatal cases are so exceptional that I would ask whether we, as a profession, ought not to protest against the stringency of some of the regulations now in force to limit its extension on the following grounds:

1st. That the disease is not of such importance as to justify the adoption of very stringent measures for its suppression. Indeed, it is well known that the majority of affected animals recover without treatment in the course of a few days.

2nd. That the restrictions have proved a miserable failure, and an enormous cost to the state.

3rd. Even supposing the restrictions were so carried out as to free the country of the disease, and the importation of live stock even suspended, have we any just ground for believing such efforts would avail to give security against future outbreaks?

4th. Is not the disease an epizoötic affection, as truly as influenza of the horse; and not only so in Great Britain, but in every country on which the sun shines? If this be not so, seeere, it may be asked, is the home of the disease? and has why nation succeeded in successfully exterminating the affection?

The law, as it now stands, is worse than useless. Let us, seek, therefore, for the removal of such grievous and inefficient measures of repression as are framed under it. Foot-and-mouth disease should be either erased from the Contagious Diseases (Animals) Act, or the clauses relating to it very much modified. By all means let it still be penal to expose in any public place an animal suffering with the disease. Some such alteration of the law, as I have hinted

at, must come eventually, and the effort to effect this should originate (I think) from our profession.

I could say very much in support of the views thus annunciated; but, notwithstanding this, I am willing to yield to proof or argument, if it can be shown thereby that my ideas are erroneous.

EXTENSIVE VISCERAL DISEASE SUCCEEDING ON CASTRATION.

By Samuel Gason Going, M.R.C.V.S., Kilkenny.

The few remarks I intend making concerning a case of disease in a year and a half old colt, which came into the infirmary of Mr. Horne, M.R.C.V.S., to be castrated, are as follows:

On the 26th September the above-mentioned colt was admitted into the infirmary to be castrated. The operation was performed the same day with clams, leaving the testicles still attached until their strangulation was complete, when they with the clams were removed. The usual results of the operation followed, viz. slight inflammation and effusion about the sheath, stiffness of limbs, &c., all of which disappeared, however, in a few days, and the animal was sent home. In about a fortnight afterwards we were called to see the colt, which the messenger stated was in a very bad condition, and that the greatest possible difficulty in passing either urine or dung existed. On our arrival some hours afterwards the following symptoms presented themselves:— The colt lay on the ground moaning piteously, its eyes were very dull, pulse weak and quick. On being made to stand it tried to urinate, but could only succeed in ejecting a few drops of urine, which was as thick as oil, and rather fœtid. The animal could not defecate, but when some of the fæces were removed with the hand they were found to be quite hard and difficult to break. Further examination per rectum showed the bladder to be quite full of urine, and that pressure caused intense pain. After carefully observing all the symptoms we came to the conclusion the animal was suffering from ascites, accompanied by stricture of the neck of the bladder. Ol. Olivæ, Oj; Tinct. Opii, ℥j; Bicarb. Sodæ, ℥iv. and also frequent injections, were exhibited: the catheter was also passed, but with difficulty, when no urine came away except a few drops. We then ordered a fomentation over the loins, and the injection to be continued, and left

another dose of oil and opium to be repeated in the evening. When we saw the animal next day he appeared somewhat better, the oil having caused the bowels to act, but still the same difficulty in urinating continued. Occasionally he urinated more freely and in greater quantities, but never without great pain. The dulness continued and the pulse was still weak; appetite pretty good; a good deal of gruel was drank. On seeing the colt next day, the bladder still appearing to be full, we passed the catheter again, with the same result. We then thought that there must be something wrong in the manner in which the catheter was perforated at the end, the holes being very small, and the urine so very thick that it could not pass through them. Not being able to afford any relief in that way, we thought it expedient to cut down on the catheter while in the urethra, and introduce a shorter one, over which we could have more command, and having the holes larger: this was done with difficulty. About two ounces of urine came away, which was very fœtid, and mixed with shreads of pus. Tincture of opium, half an ounce, and oil, four ounces, were ordered three times daily; we also applied mustard to the loins. After this treatment he appeared to rally; but our opinion was that he would not survive the night, and consequently we requested the owner to send for either of us to perform a post-mortem examination, being sure that death would supervene from the state in which we believed the bladder to be. As, however, no messenger came on the following day, I went on the next, and was informed that the animal still lived; on examining him I found general indications of improvement. The same dulness, however, existed, but he appeared easier. The urine came from both openings, and caused some pain, the bowels were open, and the pulse strong. During all this time a good healthy discharge issued from the wounds in the scrotum, and no inflammation whatever existed. The same medicine was continued, and a little acid carbol and water applied to the artificial opening in urethra.

For about ten days we saw the animal pretty regularly, during which time he in every way daily improved, but never regained his real healthy appearance. Two days after the final visit we were called to perform a post-mortem examination, the animal having on that morning died, the man said of *colic*, an assertion which was corroborated by the owner who was up the greater part of the night with the colt. On cutting through the abdomen we found the peritoneum greatly congested, in some places covered with putrid and thickened pus; in the mesentery a mass of abscesses containing ichorous

matter existed; the bowels were in a state of chronic inflammation and quite rotten, the slightest touch breaking through them: they were full of hard fæces. The whole sub-lumbar region was occupied by thin pus, and the psoas muscles were as soft as if boiled. We next examined the kidneys, which had been previously removed, and found each to be of a whitish-yellow colour, soft in texture, but still of greater firmness than the other diseased organs. I at once said they had undergone fatty degeneration, which I afterwards found to be the case by aid of a microscope. The outside of the bladder had a black appearance, and when cut into was full of mixed pus, smelling very *badly*. A quantity of thick pus obstructed the urethra for about four inches; at the base it was an inch in circumference, at the apex about a quarter of an inch; it was found to be carrot-shaped in form when drawn out. The coats of the bladder were about a quarter of an inch thick, and very soft. The ureters were greatly changed. The spermatic cords were not altogether healthy, but were more so than the other organs. We did not examine the brain, but had we done so I am confident it would have been found congested, as there is no doubt that death was caused by blood poisoning. My opinion is that the disease arose independent of the castration, as such entire degeneration could not, in my opinion, have taken place in the course of little more than a fortnight. This conclusion is strengthened by the fact that the spermatic cords were almost healthy at the lower end, but not above, whereas had death proceeded from the castration I am of opinion that the cords would from end to end have been diseased. The owner believes that the castration of the animal was the cause of death; as, however, I do not concur in this I am desirous of obtaining the opinion of some of the members of the profession. It should be observed that before the animal was cut it had a dull, languid, and unhealthy appearance.

Pathological Contributions.

CATTLE PLAGUE.

It will have been observed by our last month's report, that fears were then entertained of the entrance of the cattle plague into Belgium from the northern departments of France. These fears were quickly realised, and as early as December 3rd two cases of the disease were reported as having shown themselves in Belgium, near to the French frontier—one at Oycke, near

Audenarde, and the other at Elverdinghe, near Yprés. The diseased animals were at once killed, and stringent measures adopted to prevent the spread of infection. Other cases occurring, the Lords of the Council at once determined to issue an Order for putting a stop to the importation of cattle from Belgium, and prevent sheep also from leaving the place of landing alive.

The information since received from France is equally as unfavorable as previously, both with regard to the number of the departments and places in which cattle plague still exists, and the rapidity with which the disease continues to spread. The Central Government, however, seems at last to have determined to adopt more effective means for its suppression, a circular having been issued by the Minister of Justice to the *Procureurs Généraux*, calling on them to enforce the several provisions of the law with rigour, as already the progress of the cattle plague had cost the country millions. Besides this step in the right direction, the veterinary authorities—who, in 1865, had shown so much energy in stamping out the disease, and succeeded so admirably—have at length determined to abandon their late vacillating action, and no longer subject plague-stricken animals to medical treatment.

From Eastern Europe we learn that the disease is still very rife in Poland, and also extending its area of infection in that country. The malady has likewise broken out in the Governmental Province of Kowno, thus threatening to enter Prussia from another quarter. This state of things has determined the Provincial Prussian Government in the department of Königsburgh to forbid the importation, or the transit by rail of cattle, sheep, and goats, meat, bones, horns, hoofs, fresh or frozen hides, tallow (except when packed in casks), unwashed wool, rags, and other things likely to bring in the infection. Swine are permitted to enter, but only under special regulations with regard to railway waggons, &c.

PLEURO-PNEUMONIA.

We have but little alteration to note with regard to either the number of counties in which this disease exists, or the centres of its infection during the past month. In London and the home counties the disease still continues very rife; but in two or three of the distant counties in which it had recently broken out it would appear to have been soon exterminated.

With a disease like pleuro-pneumonia it is, however, very difficult to say when a district is free from the infection, as so long a time often elapses between the cases on the same farm; but it is nevertheless encouraging to find that the disease is held in check by the provisions of the law. More energy on the part of the local authorities and a better system of inspection, would do much towards a still further suppression of the malady, and what is of equal importance is a uniformity of action by the authorities of the several counties. Without these things we cannot hope to free the country of pleuro-pneumonia, even if it were possible to return to the days when the total prohibition of foreign cattle was in force.

FOOT-AND-MOUTH DISEASE.

A continuance of increased vigilance on the part of the local authority has resulted in a further diminution of the cases of this disease, although we have still to reckon them by thousands in some parts of England and Scotland. Irish cattle, by being moved from the place of import to different parts of the country, continue to be a fruitful source of mischief; but now that farmers have in a great measure filled up their stocks, this cause of the extension of the malady will be much diminished.

With the exception of two sheep out of a lot of fifty imported into Hartlepool from Hamburg, no returns of diseased foreign cattle have been received, during December, from the inspectors. In this case the whole of the animals were slaughtered at the port. From the Continent in general the information received is to the effect that the decrease in the cases of the disease, to which we have formerly referred, continues to be maintained.

From and after December 31st, the local authority will not be required to give notice to the Privy Council of the existence of foot-and-mouth disease; but may, from time to time, with a view to prevent its spreading make regulations for the following purposes, or any of them:—For prohibiting or regulating the movement out of any field, stable, cowshed, or any premises in which the foot-and-mouth disease has been found to exist, of any animal that has been in the same field, stable, cowshed, or other premises, with or in contact with any animal affected with foot-and-mouth disease. Notice of an outbreak is, however, to be given by the owner of the animal to a police-constable, and by him to the inspector of the local authority.

SMALLPOX OF SHEEP.

EARLY in December, one sheep of a cargo of 435 was found by the Veterinary Inspector at this port to be the subject of this disease. The animals were exported from Hamburg and landed in London. The whole of them were slaughtered at the landing-place and the skins disinfected; no mischief to our home-flocks has thus happened. Notwithstanding this importation, sheep-pox does not appear to be more rife than usual on the Continent, although it cannot be said to be ever absent from some of the German states. The reported outbreak of this disease at Malton, Yorkshire, proved to be without foundation.

SHEEP-SCAB.

THIS malady is on the increase in many parts of the country, as is usually the case during this period of the year when humid and wet weather prevails. The same would appear to be the case on the Continent, as is shown by the circumstance that during the past month several infected animals have been imported. Diseased cargoes have reached London, Hull, and Newcastle, from Germany, Holland, and Belgium. In each case prompt measures were taken to prevent any injury resulting, by the slaughter of all the animals, whether diseased or not, and disinfecting their skins. Some scabby sheep have also come into Liverpool from Valparaiso.

AMPUTATION OF THE LEG OF A HEIFER.

Mr. J. Barton Buckland, Dover, has favoured us with a short description of a case of a heifer, in which he successfully amputated one of the fore limbs. The animal, which was the property of Mr. Sandford, of Merton, met with an accident, by which a compound fracture of a most serious kind, was caused. The limb had to be amputated above the knee joint. The case went on well, the heifer being soon enabled to lie down and to rise with a facility almost equal to any other animal. About five months afterwards she had gained so much flesh and was in such good condition as to enable her owner to sell her with advantage to a butcher.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of November, 1871, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Bremerhafen . .	Hull .	Sheep-Scab .	...	1	...	...	1	1
Coruna. .	Plymouth .	Foot-and-mouth	10	...	...	...	10	10
Hamburg .	Hull . .	Sheep-Scab .	...	19	...	...	19	19
Harlingen .	,,	,,	...	5	...	...	5	5
Valparaiso	Liverpool .	,,	...	2	...	...	2	2
Total . .		Foot-and-Mouth	10	...	...	...	10	10
,, . .		Sheep-Scab .	...	27	...	...	27	27
Total . .			10	27	...	...	37	37

"ALEXANDER WILLIAMS,
"Privy Council Office, Secretary.
"Veterinary Department, 14th December, 1871."

Facts and Observations.

THE FOREIGN CATTLE MARKET.—By the time our present number is in the hands of our readers the New Market for Foreign Cattle at Deptford will have been formally opened by the Lord Mayor, so that hereafter cattle coming from scheduled countries will no longer be permitted to go to the Metropolitan Market. It remains to be seen what additional security will thus be given against the introduction of the

cattle plague, and also, whether the raising of the *cordon* that now surrounds the Metropolis will or will not, by the free dispersion of animals from London as a centre, diffuse naturalised contagious diseases throughout the country. As a market, the accommodation is superior to anything we have ever seen. The Corporation has called to its assistance all the talent it could command—architectural, sanitary, scientific, and practical—the result of which leaves nothing to be desired. The cost has been great, and what with the purchase of the site and erection of the buildings, it cannot be less than £200,000. An increase of the tolls in the present market will go to make up a portion of the interest on this large sum; but, we fear, that as a mere commercial undertaking, it cannot pay. This, however, is a matter of minor importance when viewed in comparison with the main object sought to be attained. An inspector of experience will reside within the market area, and nothing will be left undone to cause cattle plague to be confined to the spot, should it unfortunately be brought here by the importation of animals from plague-stricken countries.

Our Food Supplies.—At a recent meeting, held at Cannon-street Hotel, London, to discuss the question of our reserve food supplies in the colonies, and to promote the popularisation of tinned Australian meats, it was mentioned by Mr. E. Wilson that in the Australian and New Zealand colonies there are at the present time about 60,000,000 sheep and 5,000,000 cattle. It is calculated that one-fourth of this enormous aggregate should be available annually as surplus stock, to be slain for food. This, at 50 lbs. weight per sheep and 700 lbs. per bullock, would give about 750,000 tons weight of animal food. If this were disposed of in England at 6d. per pound, it would represent a trade of nearly £42,000,000 sterling. Yet, fabulous as these figures may seem, this vast supply would only represent abont 1 lb. of meat per head per week of the population of the United Kingdom.

White Horses.—The French Minister of War has decided that in future white or dappled-gray horses shall not be employed in military service, the experience of the late war having proved that animals of such colours offer an excellent mark for the enemy's artillery. White horses being regarded by the veterinary profession of France as lymphatic were condemned during the siege as unsuited for human consumption.—*Times.*

The Metropolitan Great Cattle-Market Returns.—The following return, showing the number of

beasts and sheep entered at the Metropolitan Cattle Market on the great market day for the years 1862, '63, '64, '65, '66, '67, '68, '69, '70, and '71, distinguishing the proportionate number of foreign animals in the total of each year, has been officially communicated to us.

	BEASTS.			SHEEP.	
	Market day.	Total.	Foreign.	Total.	Foreign.
1862	Dec. 15th	8,415	388	20,440	3,530
1863	„ 14th	10,123	1,188	26,460	5,760
1864	„ 12th	6,660	1,300	20,960	5,550
1865	„ 11th	7,591	1,620	24,780	5,300
1866	„ 17th	7,228	2,150	19,125	3,640
1867	„ 16th	8,045	1,350	21,175	7,320
1868	„ 14th	5,351	1,810	17,640	—
1869	„ 13th	6,737	1,135	17,415	4,420
1870	„ 12th	6,253	1,010	19,770	4,350
1871	„ 11th	7,346	985	23,870	6,630

Citrate of Cafeine in Neuralgia.—Dr. Arnett states that he has had great success in the treatment of neuralgia, nervous headache, hysteria, and similar affections, by means of cafeine and sulphate of morphia. His formula is—sulph. morph. gr. ½; cafein, citric acid āā gr. iij; to be given in warm coffee, or, what is better, a decoction of race ginger. It acts powerfully on the skin, equalises the circulation, thereby removing local congestion, In the majority of cases the nervous irritation may be reduced without the sulphate of morphia.—*Boston Journal.*

Absorption of Water by Leaves.—M. Cailletet, in a recent communication to the *Académie des Sciences*, states his solution of the problem whether leaves absorb water. Various experimenters have reported contradictorily on the matter, and M. Duchartre, in his latest works, answers the question in the negative. M. Cailletet proves that both sets of observers are right, by showing that absorption differs according to the conditions of the plant. If it grows in a well-watered soil, its leaves never absorb water; but if it receive by its roots an insufficient quantity of water for its vegetation, the leaves, if they are moistened, will supply this. Thus a faded branch will recover all its freshness if its summit, or even only some leaves, be soaked in water, while plants may be thus made to live without being in contact with the soil, and quite isolated from all assimilable matter.—*Union Médicale.*

THE VETERINARIAN, JANUARY 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE REMOVAL OF THE CORDON FROM THE METROPOLIS.

IN an Order of Council of December 20th, which is now in force, the following paragraph occurs:

"Whereas on the opening of the Foreign Cattle Market at Deptford the restrictions on the movement of cattle out of the metropolis may be removed."

The desire of the "trade" is at length accomplished, and the imaginary but legally impassable barrier which converted the metropolitan district into a trap exists no longer. All the machinery of police licences and market passes is swept away, and the emancipated ox is free to move in any direction by rail or road.

That considerable inconvenience has attended the enforcing of the restrictions on the movement of cattle in the metropolis we are not disposed to deny; but we cannot take leave of the protective regulations which have existed for so many years without a final testimony to their efficacy. On three different occasions cattle plague broke out, and continued for some weeks in the metropolis, without extending beyond its limits, although during the time many infected animals were sold in the metropolitan market, and but for the restrictions might have been sent to distant parts of the country; and cattle which had been herded with others affected with pleuro-pneumonia have been in countless instances prevented from spreading the infection far and wide solely by the operation of the law, which condemned them to be slaughtered within the area of the metropolis. All this is now changed, and there is nothing to prevent the sending of infected animals out of the metropolis and over the country.

The metropolitan market is a place to which not only the best animals, but also the worst, naturally converge. If

the feeder has an ox of specially fine quality and exceptional weight, he sends the animal to the London market; if he has a beast which shows signs of failing from any unknown cause, no receptacle is so convenient, so well known, and yet, as far as the identification of the animal is concerned, so obscure, as the London market. Such in effect is the testimony of a former chairman of the market, before a committee of the House of Commons, and such is the experience of all practical men.

It is true that in the Contagious Diseases (Animals) Act, and in Orders of Council which are still in force, there are provisions which, if properly carried out, will much diminish the danger to which we have alluded. For example, owners of infectiously diseased animals are bound to give notice of the existence of disease, and the local authority has power to make regulations in reference to the movement of animals which have been herded with diseased ones; the movement of the affected animals being already prohibited by the Act; but it would be too much to expect that any regulations will entirely prevent the exposure of diseased and infected animals in the metropolitan market, and their subsequent distribution over the country, or sufficiently supply the place of the barrier which has just been removed. Referring to foot-and-mouth disease, it is worthy of remark that a difficulty exists which has not been provided for. According to the terms of the 59th section of the Act any person who exposes in a market or fair, or moves along a public road, railway, or canal, any animal affected with a contagious or infectious disease is liable to penalties; and the local authorities are empowered to seize the diseased animals, and, in case of foot-and-mouth disease, detain them in a convenient place for such period as they may deem necessary.

The pressure of this clause was considerably relaxed in the metropolis by a clause in the Metropolitan Order, which is now revoked, providing that animals becoming affected with the disease in the metropolitan market or in the lairs may be moved to a slaughter-house with a police license.

This regulation was based on the assumption that London was an infected district, and that animals could not be moved out of the metropolis; but the cordon has ceased to exist, and consequently the London market is not in a position to call for exceptional legislation in reference to the movement of diseased animals.

The Metropolitan Market will be now like other markets, and diseased animals exposed for sale there will come under the 27th section of the Act. Owners of home-bred stock will probably find, at least if the Act is carried out by the local authority, that the removal of the cordon is not an universal benefit; but they will not in this instance have any reason to complain that home stock are placed at a disadvantage. It is true that foreign animals from unscheduled countries landed in the undefined parts of the Port of London, after being detained for twelve hours and passed by the inspector, cease to be deemed foreign animals, and consequently may go into the Metropolitan Market, and thence in any direction; but if a single animal in the whole cargo is found to be the subject of an infectious or contagious disease, all the animals, cattle, sheep, goats, and swine, will be detained for slaughter, or will be otherwise dealt with as the Privy Council may direct.

In reference to foreign sheep generally, there will be no alteration in the arrangements which have been in force for some time past. When these animals are landed in undefined parts of ports, and have been passed by the inspector, they are free to move in the metropolis or out of it, as they have been hitherto.

It would be absurd to expect anything like general satisfaction with the new state of things. The trade will view all the regulations, permissive and restrictive, in one light, while the home-breeder will see everything in another, and our professional readers will criticise all the changes which have been made simply in respect of their sanitary character. For our own part we are content to state the case for the information of all whom it may concern.

Reviews.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

Thoughts on the Action of Medicines, and on Veterinary Medical Politics; being the substance of a Paper read before the Lancashire Veterinary Medical Association, March 15th, 1871; with Addenda and a Defence of Science. By Thomas Walley, M.R.C.V.S.L.

Mr. Thomas Walley, who is now Professor of Cattle Pathology in the Veterinary College of Edinburgh, endeavours in the short pamphlet before us to point out some of the difficulties which belong to the investigation of medicinal action. He truly remarks:

"We cannot, like the engineer, look into our machine, and watch the various movements of every cog-wheel, crank, or strap engaged in giving it motion. Once our remedies have passed into the system of our patients, no microscope will penetrate the unfathomable darkness that surrounds their future operation; of this, we can only judge by the visible effects produced. The peculiar anomalies which ever present themselves before our eyes have not been, and cannot be explained."

Much is, doubtless, left to conjecture, and the successful empiric may perchance put to confusion the orthodox practitioner; witness the following anecdote, which Mr. Walley gives on the authority of a friend:

"An Indian, belonging to a tribe of wandering herbalists, was cited to appear before the Porto-Medico of that city. When he presented himself, he was asked by the chairman why he practised medicine without a license from that board; the Indian answered not, but quietly and pensively looking at the members of the council, he took from his wallet a dried leaf, which he handed to the chairman, with a request that he would smell it; the latter complied, and immediately epistaxis set in very violently. Simple remedies were applied unsuccessfully; more stringent ones were resorted to with the same result: all was excitement, and all now feared for the life of their chairman. The Indian said, 'I find that you, gentlemen physicians, noted for your skill and learning, have failed to arrest the flow of blood induced by the odour of that simple leaf;' with this, he withdrew

another leaf from his wallet, and handing it to the chairman, bade him smell that, and upon his doing so, the hæmorrhage ceased; all was now profound silence, the poor Indian was quietly told he might take his departure, and it is needless to say he was never again arrested in that city on a like charge."

Who cannot imagine the hopeless confusion of face which a medical board under such circumstances would exhibit.

In reference to the old and energetic system of medical treatment, Mr. Walley writes:

"The ruthless administration of drastic purgatives, the haphazard employment of the fleam and bloodstick, the indiscriminate application of the blister and the irritant, are institutions which have perished, to a great extent, with those who gave them birth. The careful way in which these remedies are had recourse to, in the present day, entirely negatives the rude and sweeping notions of the old farriers. A man who would immediately bleed, blister, and physic in cases of influenza, congestion of the lungs, &c., would be thought little removed from a state of insanity, and disappointment would be the inevitable result of his efforts. It may be, and doubtless is to a great extent, due to the alterations in the types of disease, that we hold such contrary views to those entertained and implicitly believed in by our forefathers."

We cordially recommend the perusal of the pamphlet to all the members of the profession; the time required for the purpose will not seriously tax the allotted space for labour, and much food for reflection will reward the reader.

At the conclusion of the paper the following suggestions, not unworthy of consideration, are offered to veterinary societies.

"There is work to be done, and truths to be discovered of which we know absolutely nothing as yet, which, when discovered, shall ennoble our profession, and raise it above the standard of mediocrity. At these scientific gatherings, all private differences and political matters should be inurned; the latter particularly. And if they must be discussed, and it is necessary that they should be, let it be done by a separate association, organized for the purpose, and styled the National Veterinary Reform and Improvement Association, or any other title deemed the most applicable."

Considérations sur L'Epizoötie Bovine (Typhus Contagieux Epizoötique) qui a sévi en Europe de 1709 *à* 1714. Par M. E. Dèle, Médecin Vétérinaire du Gouvernement, Membre titulaire de la Société de Médecine d'Anvers. Anvers, 1871.

Considerations on the Bovine Epizoöty (Epizoötic Contagious Typhus) which prevailed in Europe from 1709 *to* 1714.

The little *brochure* bearing the above title is the substance of a communication recently made to the Antwerp Medical Society by M. Dèle, one of its Members, and the Government Veterinary Surgeon in that city. An ordinance, issued by Maximilian-Emmanuel, of Bavaria, in 1814, relative to the Cattle Plague then devastating Europe, and which had been brought to the notice of the Society not long ago by its President, Dr. De Caisne, together with a careful study of our colleague Mr. Fleming's recent work on 'Animal Plagues,' appear to have incited the author, who is well known on the Continent as an accomplished veterinarian and earnest inquirer, to make further researches into the history of the malady during the above-mentioned period, and more particularly as to its presence in the Low Countries.

Hitherto, the materials for completing this history, especially for some of the Continental kingdoms, have not been accessible to the medical historian, so that doubts have existed as to the extent to which some countries were affected by the bovine scourge, and as to the measures they adopted to retard its progress or stifle it in its devastating course. Belgium was one of the countries that suffered so severely at that time, and until the publication of this essay the records of the visitation of the epizoöty there were meagre in the extreme. Even the Belgian Minister of the Interior, referring in 1865 to the previous irruptions of the disease, stated that there was no precise information as to the losses sustained by that country, and that those of 1768 and 1786 were the only ones against which efficacious sanitary measures were employed; and Professor Wehenkel, of the Brussels Veterinary School, in an interesting notice of the disease published in the *Annales de Méd. Vétérinaire* for 1865, says that it spread everywhere because its contagiousness was unknown, and no barrier was opposed to it.

When so little was discovered as to the history of the malady in Belgium, it can scarcely be wondered at that Mr. Fleming, in his work just referred to, should have to follow Kanold's

meagre statement, and say that it was introduced into the province of Liege in 1714.

England, as is well known, suffered from its presence for a comparatively short time, for owing to the prompt and sage measures suggested by Bates, and their intelligent adoption and enforcement by the government of the day, the country was relieved of the terrible pestilence very quickly. The measures recommended by Bates were almost, if not quite, identical with those proposed by Lancisi in 1713, but not at once, nor yet energetically carried out when the plague prevailed at Rome in that year; and Mr. Fleming could not discover whether Bates had derived his knowledge of the only efficient method of suppressing the disease from Lancisi's proposal, or whether he owed it to his own reasoning and common sense. M. Dèle seems to incline to the belief that Bates was cognizant of Lancisi's recommendations, which he borrowed for the occasion. At any rate, the conduct of the English in ridding themselves so thoroughly and quickly of the contagion appears to have elicited the admiration of other nations, and Paulet, sixty years afterwards, gave us the credit of being the first who had given such an example to the world.

But it would appear from the researches of M. Dèle and Dr. De Caisne, that measures like those of Lancisi and Bates were prescribed by Royal Ordinance in Belgium in September, 1714, certainly after Bates had made his suggestions, but these gentlemen do not appear to have discovered whether they were successfully carried out. It is much to be feared that they were not, for we find that the Ordinance prescribed certain remedies, curative and preservative, for the malady, which are certainly absurd, and which would be likely to detract from the observance of the only efficacious method of dealing with it. One of the receipts is, curiously enough, that which Bates speaks of as having been obtained from Holland to try in England, but was found quite impotent.

M. Dèle's little pamphlet is a very valuable contribution to the history of the Cattle Plague during the period to which it refers, and throws additional light on the attempts made to combat with the pestilence during the first half of the eighteenth century.

A Treatise on Horse-shoeing and Lameness. By Joseph Gamgee, Veterinary Surgeon; formerly Lecturer on the Principles and Practice of Farriery in the New Veterinary College, Edinburgh. Copiously illustrated. London: Longmans, Green, and Co. 1871.

It seems somewhat remarkable that the necessary work of nailing an iron rim to the ground surface of the horse's foot, to prevent undue wear of the horn, should have caused so much controversy and called forth so much ingenuity, apparently with so little result.

From the dawn of veterinary literature until now every writer on the art of farriery has pointed out errors and abuses, and has suggested remedies; nor can we perceive that modern writers find less occasion for complaining of the wrongness of principle and practice in our present method than those of the olden time. Mr. Gamgee's work is like the rest in this respect, he also points to errors of principle and practice, and contends for improvement. At page 31 he says: "Look in our streets; consult owners of horses; and what is the result? Lameness, the common effect, which damages and destroys more horses than all the other diseases put together to which they are liable. The cause is bad shoeing; the remedy must be good shoeing. Veterinary surgeons appear to be growing up in the idea that the forge is not a gentlemanly part of their business. It is certainly a very important one, and if they persist in neglecting it I see no alternative but to organise means for educating working farriers, who are certainly much in need of, and deserving the opportunities for, technical education, which is now engaging so much attention throughout the country. Such a consummation would be of the highest conceivable benefit to farriers themselves and the community."

With this last suggestion we agree. Much benefit would certainly arise from an improved technical education of the horse-shoer. Veterinary surgeons in active practice, whether or not they consider horse-shoeing a gentlemanly part of their business, have generally other matters to attract their attention and absorb their time, and therefore their influence on the practice of the shoer's art is trifling. We do not doubt the pecuniary advantages which arise from the association of the profession of a veterinary surgeon with the business of the forge, but we much question if the existence of any other benefit, either to the professor or the art, can be traced to the connection.

There are not many veterinary surgeons who, like Mr. Gamgee, are skilled in the practice of the farriery, and without manual tact and skill, which can only be acquired by work, we doubt if the professional man's interference with tke workman would be advantageous to either. And even when the head of an establishment possesses the necessary qualification, he cannot convey his speciality to the workman by precept, and the best informed upon the subject will most readily admit how difficult it is to get a simple direction carried into effect by the mechanic to whom use has become second nature.

We cannot recommend our readers to adopt the system proposed by Mr. Gamgee, because we cannot discover that he propounds any novel method of shoeing, unless insisting upon the necessity for good and intelligent workmen, with proper tools wherewith to properly adapt the surfaces of shoe and foot, can be so construed. But all who are interested in the art of shoeing and treatment of the feet of the horse in health and disease, will find much interesting matter in the work, which has at least the undoubted merit of being the production of a man who is practically familiar with his subject.

Extracts from British and Foreign Journals.

ON THE CELLULAR STRUCTURE OF THE RED BLOOD-CORPUSCLES.

By Joseph G. Richardson, M.D., Microscopist to the Pennsylvania Hospital, Philadelphia, Pennsylvania.

For many years after the magnificent cell theory was first accepted by physiologists, the doctrine of Schwann, who regarded the red blood disks as minute membranous sacs containing a coloured fluid, passed almost unquestioned; but of late, especially since more careful microscopic observations have become customary, it has been found that the supposed bursting of these little bladders, long looked upon as one of the strongest proofs of their cellular nature, does not take place, and at the present time some of our leading authorities, both in America and in Great Britain, assert positively that the coloured blood disks are non-vesicular, and deny any differentiation of their substance into cell wall and cell contents.

Thus, for example, Professor Austin Flint, jun., in the second volume of his great work on the 'Physiology of Man,' p. 116, remarks:—"The structure of the blood-corpuscles is very simple. They are perfectly homogeneous, presenting in their normal condition no nuclei or granules, and are not provided with an investing membrane. A great deal has been said by anatomists concerning the latter point, and many are of the opinion that they are cellular in their structure, being composed of a membrane with viscid semi-fluid contents. Without going fully into a discussion of this point, it may be stated that few have assumed actually to demonstrate this membrane, but they have for the most part inferred its existence from the fact of the swelling, and, as they term it, bursting on the addition of water; and particularly, as it seems to me, to make the blood-corpuscles obey the theoretical laws of cell development and nutrition laid down by Schwann. Their great elasticity, the persistence with which they preserve their bi-concave form, and their general appearance, would rather favour the idea that they are homogeneous bodies of a definite shape, than that they have a cell wall with semi-fluid contents; especially as the existence of a membrane has been inferred rather than demonstrated."

Professor Lionel Beale observes, on p. 169 of his work entitled 'The Microscope in Practical Medicine'—"The red blood-corpuscle of man, and mammalia generally, consists of a mass of soft viscid matter, perhaps of the consistence of treacle, composed of hæmato-crystalline. It is, at least in certain states, soluble in water, but is only dissolved by serum and the fluid part of the blood very slowly. The outer part of this matter is of firmer consistence than the interior, especially in the older corpuscles. When the latter are placed in water the more soluble matter is dissolved, leaving the harder external portion." Dr. Beale further recounts sundry considerations which, he says, prove conclusively "that the red blood-corpuscle is not a cell."

The distinguished French physiologist, Professor Ch. Robin, supports similar views, asserting, on p. 697 of 'Dictionnaire de Médecine, de Chirurgie, &c.'*—"The red blood-corpuscles are constituted of a homogeneous mass of globulin which is imbibed by or united molecule by molecule to the colouring matter, or hæmatosine, and a certain quantity of fat and saline materials. In mammals, the whole mass is homogeneous, and without any nucleus after the period when the human embryo, for example, attains a length of about an

* E. Littré et Ch. Robin, Paris, 1865.

inch; but previous to that the globules, having a magnitude of from ·010 to ·011 of a millimètre, possess a little round granular nucleus. In all the oviparous vertebrates the globule, whatever its form, encloses a colourless spherical or oval nucleus, insoluble in water and acetic acid, while the red mass is soluble in these menstrua."

In the course of some researches of my own, however, "On the Detection of Red and White Corpuscles in Blood Stains,"* I have shown, first, that if a few drops of fresh blood be stirred up in many times its bulk of pure water, the coloured hæmato-crystallin will be dissolved, while a whitish insoluble residue, found under the microscope to be composed of transparent hyaline spheres about $\frac{1}{4300}$th of an inch in diameter, subsides to the bottom of the vessel; secondly, that if a fragment of dried blood-clot is exposed to the action of a current of fresh water, the hæmato-crystallin will, after a few minutes, be washed away, leaving an aggregation of what appear to be similar delicate cells, altered in shape by mutual pressure, but still preserving much of their rounded contour; and thirdly, by a calculation of the superficial area of the human red blood disk, based upon accurate measurements of its dimensions when magnified nearly 1800 times, that supposing a cell wall to exist, there would be almost precisely enough membrane contained in it to cover the surface of a sphere having the exact diameter of the red corpuscles when rendered globular by the action of water.

In one of my experiments on the action of water upon blood, as detailed in that paper, the development of Bacteria so obscured these supposed membranous cell walls that they became unrecognisable after standing seventy-two hours, so that, in order to determine whether their apparent insolubility could be overcome by prolonged maceration, I made the following additional investigations:—

On the 24th of March, 1870, I thoroughly stirred two fluid drachms of blood into two fluid ounces of fresh water, and allowed the mixture to stand undisturbed for forty-eight hours, when a light and flocculent deposit of a pale pink colour, occupying about half a fluid-ounce of the liquid, had fallen to the bottom of the vessel. On examination under the $\frac{1}{50}$-inch objective, this was found to be chiefly composed of very transparent spherical bodies, about $\frac{1}{3300}$th of an inch in diameter, which became beautifully distinct and quite visible with an ordinary $\frac{1}{4}$-inch when tinted by a minute portion of aniline solution introduced at the margin of the

* 'Am. Jour. of Med. Sciences,' July, 1869.

cover. In order to prevent the development of Bacteria, about two fluid drachms of carbolic acid solution were added, and the mixture kept covered in a room of ordinary temperature for four weeks, at the end of which time the delicate colourless spheres were still distinctly visible, although they had a little further diminished in size, only measuring about $\frac{1}{5000}$th of an inch across.

From these various observations, it appears that human red blood-corpuscles are composed of two different ingredients, the one hæmato-crystallin, of a crimson colour, and dissolving freely in water, the other of a whitish hue, and insoluble in water, even on prolonged maceration; but so minute are the blood disks in mammalia generally, that it is extremely difficult to determine the exact relation of these constituents to each other. It occurred to me, however, that investigations upon the large blood-globules of reptiles might be more successful, and after numerous disappointments I procured, in November last, from a former patient near my late residence on Cayuga Lake, in Western New York, two specimens of the Menobranchus or Proteus, whose red blood disks, as far as known, with a single exception, exceed those of all other animals in magnitude, measuring about $\frac{1}{45\frac{1}{0}}$th of an inch in length by $\frac{1}{650}$th of an inch in breadth, and actually visible, in a strong light, to the naked eye of a myopic person like myself. The gigantic corpuscles being about six times the diameter, and consequently 216 times the magnitude of those of man, evidently afford much better opportunities for the detection of their membranous parietes, if such exist; and in addition to this great advantage, I discovered, quite unexpectedly, in the course of my experiments upon them, that their coloured portion possessed the remarkable property of crystallizing with great readiness *within* its envelope, and so enabling us to analyse, as it were, the corpuscles, by furnishing a singularly positive demonstration of the existence of a cell wall, totally distinct from the cell contents which undergo crystallization. These crystals, as often happens with those produced in the presence of organic matter, are frequently irregular, but their typical form appears to be that of a quadrangular prism, with dihedral summits, the angles sometimes being truncated. They may be easily prepared, as I have now done at least fifty times, by depositing a drop of blood from the Menobranchus upon a slide, allowing it to remain uncovered about ten minutes, or until a mere line of desiccation appears at the margin, and then covering it with a thin glass; on examination with a power of 200 diameters, numerous corpuscles along the edge of the

drop where the liquor sanguinis has become most concentrated will be frequently discovered to contain one, two, or more crystals; and under the most favorable circumstances of temperature and hygroscopic condition of the surrounding air, I have seen this process of crystallization go on until the contents of almost every corpuscle assumes the crystalline form, either wholly or in part, the cell wall being left in the former case perfectly colourless and transparent.

The effect of these crystals as they gradually elongate is very remarkable and interesting, being precisely that which would be produced by sticks of similar shape contained within an ordinary bladder partly filled with fluid; thus, for example, I have several times seen a single crystal, as if increased in length, thrust out the ends of the oval corpuscle, until the conjugate diameter of the cell became one third greater, while its transverse dimension diminished to less than half its original magnitude, the nucleus being compressed closely against the side of the prism. Or in cases where one or more crystals happened to lie across the long axis, that decreased until the whole corpuscle assumed a lozenge-shaped or rectangular form, as in a very perfect specimen which I have mounted dry, the folded edge of whose capsular membrane may be seen supported by the crystals, like a washerwoman's clothes-line upon its prop.

It may in the first place be objected to this demonstration, that the appearance which it affords of a plicated membrane around the extremities of the crystals is caused by partial desiccation of the surface of the corpuscle while the specimen was being prepared; that such cannot, however, be the case, is proved by the fact that if, to blood freshly drawn from the reptile upon a slide, water is added, beneath the microscope we can produce an exosmosis of the coloured material into the diluted liquor sanguinis, leaving the same transparent cell wall, which becomes visible when the cell contents are crystallised within it; and it is obvious that a membranous envelope, which is equally distinct under the opposite states of dryness and moisture, cannot be considered the result of either condition. Again, perhaps it will be asserted, secondly, that the appearances here presented might be simply the result of partial crystallisation in such a drop of viscid material as Professors Flint and Beale consider the red blood disks, which drop, if the process were complete, would have entirely assumed the crystalline form; but I think I can quite destroy the force of that or any similar argument by the aid of other mounted preparations, some of them showing that well-developed crystals, which happen to

lie in favorable positions, may include almost all the coloured portion of the corpuscle, without in the least affecting the contour of its cell wall.

I regret exceedingly that the difficulty of obtaining and preserving the Menobranchus alive has prevented me from attempting to exhibit specimens of its fresh blood; but in the hope that other microscopists will repeat and correct or confirm my researches upon it, I am desirous of recording them and the conclusion which they seem to involve.

After a great many attempts, on which I spent altogether about eight hours' steady work, I have twice succeeded in cutting a corpuscle in two with sharpened needles upon a stage of the microscope, and beneath a half-inch objective, combined with a No. 2 eye-piece. On penetrating the vesicle with the edge of the needle, its coloured contents were instantly evacuated, and disappeared at once in the surrounding fluid, while the cell wall immediately shrunk together, and became twisted upon itself and around the nucleus into a perfectly hyaline particle, which showed some tendency to adhere to the point of the instrument. It would therefore seem that the hæmato-crystallin was neither viscid nor semi-solid, and that the cell wall was structureless, and possessed only moderate tenacity, but of course the observations were too few in number to be accepted as conclusive.

When the corpuscles remained for two or three hours under observation, those which did not crystallise often showed the wrinkled appearance figured by Hassal in his Illustrations, and described by Rollett, in Stricker's 'Handbuch der Lehre von den Geweben,' Zweite Liefrung, S. 286, and which seemed to me due to the tendency of their colourless envelope, as the contained hæmato-crystallin condensed around the nucleus, to accommodate itself to the diminished contents of the cell by falling into folds frequently ramifying from the nuclear centre. When pressure was made by means of a mounted needle upon the covering glass, almost directly over a red disk, whose contents had undergone this contraction, the first effect was to round out the contour of the corpuscle, and unfold the creases in its walls, the globule behaving as you might expect a bladder half full of water to do if you stepped firmly upon its centre; on continuing the process, however, no rupture of the walls could be detected, the contained fluid appearing to rapidly transude through its former envelope, which, on the needle being removed, collapsed to perhaps half its former size, and presented the aspect of a loose bag, almost without coloured contents, surrounding the nucleus. These changes were also examined under the $\frac{1}{25}$-inch objec-

tive, giving a power of almost 1200 diameters, by adjusting its component lenses, for a covering glass slightly thinner than that actually employed, and then cautiously screwing down the objective, so as to compress a blood disk beneath it; under this finely graduated pressure and high magnifying power, the apparent expanding of fold after fold, in the plicated wall of a previously wrinkled corpuscle, became strikingly evident. After tinting the external portion of the red disk with aniline solution, and then applying considerable force to the covering glass, either by means of a mounted needle under a low power, or, with the extremity of a high objective itself, so as to empty out all the hæmato-crystallin, the shrivelled envelope could be traced after the removal of the pressure closely applied to the surface of the nucleus, and under such circumstances occasionally presented an obscurely granular appearance.

Sometimes a few of the corpuscles situated near the edge of the thin glass, and therefore most exposed to the action of the air, appeared, after three or four hours, to become cracked in various places from the circumference to their centre; those fissures seem to involve not only the cell contents, but also the supposed cell wall; although at first sight this phenomenon may be deemed inconsistent with the older theory, in regard to the structure of the red disk, yet I think that it can be explained by supposing that the hæmato-crystallin had in these cases undergone a sort of troubled crystallization, causing it to form a mass of tolerable firmness, which split into fragments as it became dry, and at the same time cracked its membranous envelope, just as a piece of muslin frozen fast to a lump of ice is sometimes broken with the fracture of the surface to which it is attached. In some instances, the delicate and transparent cell wall could be detected in the flaw of the hæmato-crystallin, its outer edge showing a concave line across the peripheral extremity of the fissure.

The addition of water to the fresh blood gave very interesting results, and occasionally afforded an admirable proof of the existence of a membranous envelope. The first effect of diluting the liquor sanguinis was to increase the thickness of the corpuscle, and under its further action the disk gradually became less elongated, until it assumed a spheroidal form, the coloured portion being rapidly dissolved out, and leaving the nucleus and cell wall more distinctly visible. In one instance, a corpuscle which had become quite decolorized attached itself to some little mass of granular matter, so that it could be retained under observation while I set up cur-

rents beneath the cover by tapping the latter with a mounted needle. On changing the direction of these currents so as to strike the disk upon various parts of its surface in succession, I was enabled to satisfy myself conclusively that it possessed a bladder-like cell wall, perfectly flexible (now that it was no longer distended with hæmato-crystallin), and capable of being dimpled in, as it were, by the force of the current impinging upon any side until it applied itself accurately to the subjacent surface of the nucleus, thus furnishing strong evidence against the doctrine of a sponge-like stroma (or oikoid), as taught by Brücke and Stricker, being a constituent of the red blood-corpuscle.

If water was allowed to flow in upon a specimen whose disks had undergone the curious crystallization above described, diluted liquor sanguinis seemed to rapidly enter the corpuscles, by endosmosis, and dissolved the contained crystals which generally assumed a foliaceous appearance, such as we often see crystals of triple phosphate put on when macerated in alkaline urine. As the hæmato-crystallin dissolved, the natural colour of the corpuscle was restored; its walls, if they had been previously propped out upon the points of the crystals, reassumed their normal shape, and in some instances these shortened or broken crystals were observed to move freely in the cavity between the nucleus and the cell wall.

Before attempting to make any deduction from the above experiments upon the blood of the Menobranchus, it may not be amiss to refer briefly to the views entertained by most German writers in regard to the red blood-corpuscle. According to Rollett, in Stricker's 'Handbuch' above referred to, p. 296, Henson was led, from the apparent retraction of the cell contents from the membrane as seen in the blood-corpuscles of reptiles, to ascribe to the red disks a protoplasm which, accumulated especially around the nucleus and over the inner surface of the envelope, was bound together by delicate radiating crossed threads, and in its intestines contained the coloured liquid cell contents (gefärbte zellflüssigkeit); but in the opinion of Rollett, this thing is untenable in view of the knowledge we have lately obtained in regard to the properties of protoplasm, from the researches of Max Schultze and Kühne.

Brücke, who has observed these appearances after the action of a 2 per cent. boric acid solution, pictures to himself in explanation thereof, in the first place, "a porous form element, consisting of a motionless, very soft, colourless, and perfectly transparent substance; further, he represents to

himself the body of the corpuscle as composed of a living organism, whose central portion forms the nucleus of all nucleated red blood-globules, and is free from hæmato-globulin, while the remaining portion contains the entire mass of the latter. The last-mentioned part Brücke considers as lying in the interspaces of the porous mass, filling them completely, but at the same time forming a continuous whole with the non-pigmented portion. The colourless porous substance he calls *Oikoid,* all the remainder he names *Zooid;* and considers that, by the partial or complete withdrawal of the Zooid from the Oikoid, the occurrence of the above-mentioned appearances is explained. Stricker himself believes in the Oikoid of Brücke, but calls the remainder of the corpuscle its body (der Lieb)."

Recapitulating now the facts which I have detailed, militating against the views of Flint, Beale, and Ch. Robin, who hold that the red blood-corpuscles of mammals are homogeneous drops of a jelly-like substance, we find, first, that when human blood is diluted with pure water the bi-concave disks in general gradually assume a bi-convex and finally a globular form, their coloured portion being entirely dissolved, sometimes in the course of a few minutes, while the transparent colourless constituent which retains the spherical shape is completely insoluble in water, even during the prolonged maceration of over thirty days; and second, that when a mass of desiccated corpuscles, such as occurs in a dried blood-clot, is washed with pure water, so as to remove all the hæmato-crystallin, the outlines of the compressed red blood disks may be readily detected on examination with a sufficiently high power; further, that in the red globules of the Menobranchus, which may be supposed to bear a more or less close analogy in their constitution to those of mammals, it is possible to analyse the corpuscle by separating the coloured cell contents from the colourless cell wall, either by puncture of the membrane, by crystallization of its enclosed fluid, or by pressure upon the corpuscle, forcing out its contents apparently through the pores of the membranous capsule in the same manner that quicksilver is strained by pressure through the sides of a buckskin bag.

In opposition to the theories of Hensen, Stricker, and Brücke, who consider the red blood-corpuscles are made up of a colourless porous substance called Oikoid, and a coloured more fluid ingredient denominated Zooid, may be enumerated the following circumstances:—First, if, on the one hand, we consider that a porous substance of the definite bi-concave form, analogous to a disk of compressed sponge, exists, it

seems impossible to account for this stroma assuming a globular shape when acted upon by water, since the full diameter of the sphere, when formed, is occupied by the least amount of distended matter, while the dimension, in which lay the greatest bulk of stroma previous to the addition of water, is actually diminished; on the other hand, any hypothesis that the porous substance coalesces, on the removal of its hæmato-crystallin, into a jelly-like drop, is negatived by the fact that occasionally, as is also described by Professor J. C. Dalton, one side of a corpuscle, rendered colourless by water, fails to assume a convex form, being apparently sucked in by the other side, which becomes exaggeratedly convex, until the whole corpuscle resembles a bell, or more accurately a liberty cap, in shape, without any tendency to present the outline of a sphere. Second, the appearance of the specimens I have examined strongly indicates the existence of a dense membrane, thrown into folds around the extremities of projecting crystals, just as a loosened tent cloth would be around the point of a cane thrust against it from the inside; and further, the movement of the crystals, when partly dissolved, around the nucleus, but confined within the corpuscle, as described in the early part of this paper, both tend to show that the cavity of the corpuscle between the nucleus and the membranous envelope is quite unoccupied by solid matter. Third, the perfect freedom with which one side of the cell wall of a red blood-globule from the Menobranchus when acted upon by water may float in until it touches the nucleus, and out again to its old place, will, I think, furnish conclusive evidence to any one who sees it as I have done, against the existence of a porous substance which maintains the shape of the blood disk.

From these researches I therefore conclude that the older theory, which asserts that the red blood-corpuscles of the vertebrata generally are vesicles, each composed of a delicate, colourless, inelastic, porous, and perfectly flexible cell wall, enclosing a coloured fluid, sometimes crystallizable, cell contents, which are freely soluble in water in all proportions, explains the physical phenomena presented by red blood-globules far more satisfactorily than any other hypothesis which has hitherto been advanced; and, moreover, that the usual bi-concave discoid form of the corpuscles in most mammals, as well as the change of shape which they undergo in fluids of greater or less specific gravity than the liquor sanguinis, becoming crenated in denser, and globular in rarer liquids, are such as to be perfectly explicable by the light of our present knowledge in regard to the laws of the exosmosis

and endosmosis of fluids through membranes; the equilibrium of these forces being maintained in normal serum, and one or the other being rendered preponderant if the specific gravity of that fluid is disturbed.—*Transactions of the American Medical Association.*

THE NATURE OF VIRUS.

That a considerable number of diseases—embracing amongst them some of the most important and some of the most frequent occurrence—result from the action of a virus or poison, few or none will be disposed to deny; but if the question be asked, what is the nature of a virus, or the material that enables the disease to be communicated from one animal to another? the answer given by the best instructed members of the profession would, we apprehend, be far from unanimous. It is well known that in all virulent fluids a clear fluid or serum may be discerned in which certain morphological elements, molecules, nuclei, cells, and *débris* of cells, are discernible. The question is, whether the poisonous agent is disseminated uniformly through the fluid, or is a special quality belonging to or characteristic of the corpuscles. This question, interesting in many points of view to the practical surgeon, M. Chauveau has undertaken to investigate, and has given the results of his inquiries in a series of lectures delivered before the Société des Sciences Médicales de Lyon, and reported in the *Revue Scientifique*. He states in the most unequivocal manner that the virulent property is associated, not with the fluid, but with the corpuscles held in suspension. This opinion he bases on the following facts:—First, that, if virulent fluids are diluted with water or other inert material, and their activity be then tested by inoculation, it will be found that they act, not as if they were uniformly diffused through the fluid—that is, not with diminished virulence only, as though weakened by dilution,—but irregularly, and as though the poisonous quality were limited to particular molecules dispersed here and there through the fluid, and the more distant from each other in proportion as the fluid is more diluted, some of the inoculations failing altogether, whilst others are as energetic as usual; and secondly, that, if the plasma or serum be carefully separated from the molecules and cells, the former proves inocuous when introduced into the system, whilst the latter retain in a high degree the

poisonous properties. The difficulty of isolating the corpuscles and cells from the plasma is much greater than might at first sight be imagined. It is impossible to effect it satisfactorily by merely straining the fluid, for in this operation it may always be objected that a part of the plasma still remains adherent to the cells, and accounts for their active properties. M. Chauveau advances various reasons against the employment of dialysis, and, in order to obtain the cells as pure as possible, proceeds in the following manner:—The purulent fluid (and he prefers the fluid obtained from the pulmonary abscesses of horses affected with glanders, as possessing an extraordinary degree of activity and virulence) is first washed with ten times its bulk of water, and, after standing for two hours, the superjacent fluid, containing cells and molecules free from coarser fragments, is strained through filtering paper. The material left in the filter is washed over and over again with many hundred times its bulk of water, and allowed on each occasion to precipitate to the bottom of the vessel. By these means, which occupy nearly forty hours, he considers he has withdrawn or washed away all the adherent plasma. But if a small portion of the mass of the corpuscles, leucocytes, mucous globules, proliferating cells, columnar epithelium, and granulations, all more or less swollen with water, be introduced with a lancet into the cheek of a perfectly healthy horse or ass, the initial symptoms speedily become apparent, and demonstrate in the clearest manner that they constitute the true poisonous agents. The means adopted by M. Chauveau to discover which of the morphological elements are to be regarded as the active agents we reserve for consideration.

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

STUDY ON TINEA FAVOSA IN THE DOMESTICATED ANIMALS.

By M. F. Saint-Cyr, Professor at the Lyons Veterinary School.

(*Continued from vol.* xliv, *p.* 912.)

Third Fact.—Observation.—Transmission of the Favus of Animals to Man; Unusual Form the Eruption may assume in this case.

I have said, in the course of this memoir, that the favus of animals may be transmitted to the human species, and I

have cited, in support of this assertion, an experiment made by Dr. Tripier, of this town, and also two observations, which, unfortunately, were not complete. Now, however, I am in a measure able to give an undeniable proof of this transmission, which is much more easy and frequent, perhaps, than is generally believed. This is the fact:

During the whole time that the above-mentioned experiment was going on I each day observed and *touched*, without much precaution, my diseased puppies, pleased as I was to note and to follow the progress of the disease I had given them, but never thinking there was any danger to myself as a consequence of these repeated examinations. On the 4th of January, however, I perceived on the dorsal aspect of my left hand, in the space comprised between the thumb and index finger, a patch about the size of a ten-franc gold piece, on which the skin was cracked, and exfoliating in furfuraceous pellicles. I thought immediately of the possibility of inoculation from the dogs, and as I certainly had no idea of attempting the experiment on myself, I concluded that chance had done so for me, and it was necessary now to go on with it. But was it really a favus inoculation? There was as yet nothing to prove it, and I concluded to wait.

On the 6th the patch had extended, and attained the dimensions of a silver franc piece; it was markedly *erythematous;* the surface of the epidermis was still cracked, and on the margin of the patch, where it was falling off in flakes, it had a raised border of a silvery tint; the patch itself was regularly circumscribed, and was the seat of a very lively pruritis. I allowed the disease to follow its course, only taking the precaution to wear constantly, night and day, a glove on the affected hand, to avoid the danger of auto-inoculation in some other region, where it would be less easy to watch its progress.

On the 14th the patch had notably increased, and was the size of a five-franc silver piece; at its centre the epidermis was yellow, thickened, rough, and cracked; all around the borders was a circle of fine vesicles, filled with a limpid serosity, and varying in dimensions from a small lentil to that of a little pea. In a word, this patch offered all the characters of a fine specimen of *Herpes circinnatus* (ringworm). Such, in fact, was the diagnosis made at first sight by M. Rollet, to whom I showed it on that day, and who was desirous of studying it with me.

But after attentively examining the pretended *Herpes circinnatus*, we were not long in discovering, *on a level with some hairs, small yellow spots the size of a pin's head, whose centre*

appeared to be depressed, as if it had been picked out with the point of a needle. Some of these yellow points were carefully removed, and then they looked like *Favi in miniature.* Examined in the microscope, conclusive evidence as to their nature was discovered in the presence of *all the elements of the Achorion,* and particularly in an *abundance of the mycelium,* so much so, indeed, that on seeing them M. Rollet could not help exclaiming—"Here is really my favus of the Antiquaille; it is exactly the same; there can be no mistake!"

Another examination, made the same day at the Veterinary School, with the concurrence of M. L. Tripier, had the same result. This gentleman, brother to M. R. Tripier, whose name has often appeared in these memoirs, who is deservedly well known for his microscopical researches, and who watched the course of the inoculated Tinea in his brother, like M. Rollet, recognised in the disease on my hand, *not a legitimate Herpes circinnatus, but a form of veritable Tinea favosa.*

No doubt could, therefore, exist as to the nature of the malady; it was the *Tinea* derived from the puppies; they had returned me what I had given them; it was justice.

I thought it useless to prolong the experiment, and that it was necessary to oppose the progress of the disease as quickly as possible. Consequently, the same evening I applied to the part an ointment composed of—

Corrosive sublimate . .	10 centigrammes.
Glycerine	20 grammes.

On the 15th, 16th and 17th, I continued this treatment thrice every day, rubbing in this preparation gently, but for a long time.

On the 18th of January the success attending the application was not such as I had expected. The centre of the patch appeared to be cured, but its circumference continued to extend; its borders were inflamed and painful, and marked by a circle of vesicles full of real pus. I then decided to cauterize this circle with solid nitrate of silver, and continued the frictions with the afore-mentioned application.

On the 20th of January the pustular circle had been destroyed by the cauterization, and did not again appear; nevertheless, all was not yet concluded, for there were observed six new but small *Favi* seated at the base of as many hairs. These were cauterized individually and severely with the caustic, and the ointment was continued, double the quantity of sublimate being used in its composition this time.

From this date the disease ceased to spread, and nothing had to be done but wait until the eschars produced by the

cauterization had fallen off. This took place slowly, and when accomplished some sores remained whose cicatrization was not so rapid as I would have wished; so that it was not until the beginning of February that I could consider myself entirely free from the disease, the last traces of which had not quite disappeared on the 20th February, 1869.

There can, then, be no doubt of the fact that the *Tinea* of animals is transmissible to mankind, and this observation, by its results, throws light upon the others, less complete, reported in the course of this work, and which, while they are really significant, might without it be easily mistaken; it proves that the danger I have shown might result from the contact of diseased animals with mankind is not chimerical.

But the observation appears to me to be really important in another point of view; it proves, in fact, that in the diagnosis of cutaneous parasitic affections the *anatomical form* alone must not be relied upon, and that it is more essential to discover the *cause*—to find the parasite itself.

The disease with which I was affected had the *form* of *Herpes circinnatus*. M. Rollet thought at first that it was this malady, and so did several other competent medical men to whom I showed it. And yet, as I have said, and as I repeat, it was only by a more careful examination, and especially by studying the cryptogam, that we were able to attribute its production unhesitatingly to the *achorion*, and not to the trichophyton.—(*Recueil de Méd. Vétérinaire*, September, 1869.)

Lately I have had occasion to collect some new facts, and to make some additional remarks on the *Tinea* of animals, and these remarks I believe I ought to resume here.

In the lecture to which this article is a complement I said that, since 1864, I had frequent opportunities for observing the disease in cats brought to the clinic of our Veterinary School; that I have once seen it in the dog, and that it had been noticed incidentally, by some few observers, among mice. This year (1869) I have had occasion to see it myself in this little rodent, and also in the rabbit, an animal in which it had not yet been witnessed. Lastly, I have been able to signalise certain cases of its transmission from animals to man. The following is a succinct *résumé* of the observations I have gathered on this subject.

1. *Tinea in Mice.*

On May 29th, 1869, the students of the Veterinary School brought me two mice they had caught and killed in their rooms, and whose bodies were covered with yellow crusts.

On examining these animals I at once recognised that they were affected with *Tinea*. On different parts of the cutaneous surface, but particularly the head, there were dry, irregular, split-up crusts of a yellow colour, raised in the margins and depressed in their centre, in the form of a cup, and of an aspect altogether characteristic. Wherever these crusts were the hair had fallen off, but everywhere else the skin was healthy; beneath the crusts it was depressed and thin, but not ulcerated. Examining these crusts in the microscope with a power of about 450 diameters, they were found to be almost entirely constituted by the elements of the *Achorion*.

On June 1st following, a third mouse was captured alive by the same students, and it was also affected with *Tinea*, its head, from the tip of the nose to the extremity of the ears, being literally covered with it, and this gave the poor little creature a most singular aspect. In consequence of their confluence the cups were less distinctly marked than in the other two mice; but the general appearance of the crusts, their sulphur-yellow colour, and especially the results of a microscopical examination, left no doubt whatever as to the real nature of the affection.

From this moment a veritable hunt after diseased mice was organized among our students, and it was so successful that on June 9th they brought me two more of these creatures in a diseased condition; on the 11th a sixth, and on the 23rd a seventh, all affected with *Tinea* in various degrees. The last, more particularly, bore a magnificent cup on the skin of the lower lid of the left eye.

On July 17th one of the students, M. Herbet, also brought us another diseased mouse which he had taken alive in his room. This one was extremely bad; the whole face was, so to speak, covered by a thick mask formed by a continuous crust, which was dry, yellow, and powdery in places, very adherent at certain points, easily detached at others, and when removed leaving the skin depilated, irritated, and of a reddish-violet colour, but not ulcerated. This crusty mass extended over the eyelids of the left eye in such a manner as to completely cover that organ. Independently of this principal mass, there was found on the margin of the concha of the left ear a very small *Favus*, scarcely so large as the head of a pin, but whose characteristics were well defined. There were also on the trunk two thick *Favus* plates, about the diameter of a gold ten-franc piece, and situated one on the right the other on the left side of the chest, where they formed prominences very appreciable to the touch. These crusts did not exhibit a cupuliform shape, but rather

that of a flattened tubercle. On their surface the hairs were bristly, dull and dead-looking, while elsewhere they were glossy and lustrous.

It is needless to say that the microscope was not neglected in this case, nor yet in those preceding it, and that again we found with the greatest ease, the elements of the *Achorion*. It may be added that, notwithstanding the advanced stage to which its cutaneous affection had arrived, this little creature appeared to enjoy excellent health, and that we kept it alive under observation for several days.

Finally, in the last days of August, our director, M. Rodet, obligingly forwarded me another of these rodents, caught in a trap in his own apartments, and which was, like the others, affected in a very high degree.

Here, then, were *nine mice suffering from Tinea*, caught or killed at the school in the space of a few months. No doubt these rodents had found the germs of the disease in our hospital, while frequenting the place where I kept my experimental animals, and where I had lodged at one time seven puppies affected with the malady. But what is worthy of remark is that the cats belonging to our establishment, which lived at large in the courtyards and lofts, and carried on a very active warfare with the mice, did not appear to contract the affection. I say *did not appear*, for they were so savage that it was not easy to catch and examine them. Otherwise their freedom from the disease is well accounted for by their being all either adults or old, and, as I have established, these are much more refractory to the contagion arising from the transport of the spores of the *Achorion* than young animals.

This difference in aptitude to contract *Tinea* according to the age finds a new confirmation in the following observation, one of the most interesting and complete that I have made since I commenced to occupy myself with this subject, which is so worthy of attention.

2. *Tinea in the Rabbit.*

On June 11th Dr. Mourraud, of Lyon-Vaise, who had read in the *Lyon Medical* a summary of my memoir on the "Tinea in Animals," sent three young rabbits in which he had recognised the disease, and which he generously gave me for the purpose of study. At the same time he supplied the following information:

These rabbits were about two months and a half old, and formed part of a litter of seven; they were well kept. It was not known where they got the disease, and among the

people who had been in contact with them none had *Tinea; all the young* were attacked with the malady in various degrees, but those forwarded were the worst. Dr. Mourraud prescribed a method of treatment for the others, of which corrosive sublimate formed the basis, and he hoped to cure them. The buck and doe, who lived all the time with their young, were until now exempt.

The following was the character of the disease in the three patients. It may first be mentioned, however, that they were very pretty little Russian rabbits, completely white, with the exception of their ears, which were black, and that their general condition, to judge from their vivacity, appeared to be very satisfactory. Only over nearly the whole surface of their bodies—on the paws, head, and trunk—were seen disseminated numerous yellow plates of variable dimensions, but all exactly resembling each other in form. Otherwise these crusts were not equally numerous nor equally distributed in the three subjects, which, to facilitate description, we shall designate numerically.

No. 1 was the most affected. Crusts were found on every part of its body—head, ears, paws, and trunk. On the latter region the crusty patches were relatively less numerous, discrete, and often concealed by the hair. The paws, on the contrary, had them most frequently confluent, thick, and rugged, and the depilation was very extensive. On the head they were both isolated and confluent.

No. 2 was the least affected. An attentive examination of it did not reveal any *Favus* on the trunk, but there were a large number on the limbs and head; in the latter region particularly we counted twenty-five to thirty on each ear, besides a group of four on the upper lip, and another group of three above the left nostril.

Less affected than No. 1, but more than No. 2, No. 3 also showed numerous favous plates; these were on the body, where they were comparatively rare, and on the paws, head, and ears, where they were found in very great numbers.

Altogether the characters of the disease were so defined that it was impossible to mistake it, or to confound it with any other. So much was this the case that Dr. Mourraud, although he had never seen *Tinea* in animals, and was only made aware of its existence in them through reading my memoir, did not hesitate in recognising and diagnosing it.

In the three patients its characteristics were identical, and these I shall attempt to summarise as exactly as possible.

I have already said that it consisted in the presence of dry crusts, more or less large and thick, isolated or confluent.

The isolated crusts varied much in dimensions; the smallest scarcely exceeded in size the head of a pin, while the largest attained the diameter of a twenty-centime piece. In general they were very regularly circular, and formed a well-marked prominence on the skin. Their surface, always dry, was sometimes smooth, polished, and almost shining, when not altered by friction, and at other times irregular, fissured, and gritty, when they had been submitted to the repeated contact of external agents. When they had attained the dimensions of a small lentil they became notably depressed in their centre, which was frequently traversed by a small tuft of fine hairs; their shape reminded one of a chemise porcelain button. Those of small dimensions rarely presented the cupuliform aspect, and were in general regularly hemispherical, but then the hairs did not pass through them. The colour of these crusts varied from a canary-yellow to a sulphur-yellow hue.

At certain points there were also found a mass of crusts of the same nature, but much more extensive, whose dimensions might reach that of a franc or even a two-franc piece. The contours of these large crusty plates, so far from being exactly circular, were very irregular; their surface was papillated, and presented here and there some bristly hairs, which were generally but little adherent. These plates only showed in a confused manner, or not all, the cupuliform aspect. When attentively examined, it was easy to see that they were formed by the union of a variable number of *favi* primarily distinct and isolated, but which, becoming developed in the vicinity of each other, became joined and more or less completely confounded, so as to form one large crust.

All these crusts, the smallest as well as the most voluminous, were composed of the same elements; there were spores, isolated or united in chaplets, sporophorous tubes of diverse forms and dimensions, and numerous mycelium-filaments.

The abundance of the latter element—which in some preparations was found to be predominant, and was particularly noticeable on the *intact surface* of the favi—the considerable volume of the spores, and their frequently ovoid shape, and the frequency of the chaplets, such were the characters of the cryptogamic vegetation which authorised me to ally it unhesitatingly with the *Achorion Schönleinii*, and to separate it from the *Tricophyton*, the spores of which are smaller, more commonly spherical, more rarely joined as a chaplet, and in which, more especially, the mycelium is relatively rare.

In the intervals between these crusts, and even to their extreme limits, the skin was healthy and supple, showed no trace of any alteration, and was covered with shining silky

hair; beneath them it was thin, depressed, much irritated, red, and, after the removal of the *favus*, exuded a small quantity of liquid serosity in which was found, on microscopical examination, a goodly number of spores, some filaments of mycelium, and epithelial cells. Otherwise the skin was not ulcerated.

Such was the nature of the disease in the three rabbits on the 11th of June, when they were given up to us to study. It now remains to complete the history of each.

On the morning of the 13th, No. 1, the most seriously affected, was found dead in its pen. This rapid demise could not be accounted for, as on the previous evening the animal appeared to be very well, and the autopsy did not reveal any grave lesion in the internal organs.

Nos. 2 and 3 were all right. They were not submitted to any treatment, for before attempting to cure them we were desirous of observing the natural progress of the disease for some time. They were therefore kept under observation until the 24th of June, at which date they continued to be in good health; they were active, lively, and had a very good appetite. Their cutaneous affection underwent some modifications which ought to be alluded to here.

In No. 2 no new cups were seen; on the contrary, some had spontaneously disappeared, and the crusts of which they were composed fell off and were not reproduced; in their stead the skin was depilated, but sound, supple, and not inflamed. The disease seemed, therefore, to have a tendency to retrograde spontaneously rather than to extend.

This was not the case with No. 3. In it the *favi* existing on the 11th had enlarged, and others had become developed on the head as well as on the body, and this creature was now as gravely affected as was No. 1 on the 11th. Nevertheless its general condition continued to be satisfactory.

At this date it was decided that No. 3 should be submitted to curative treatment. Consequently it was prescribed that all the crusts should be detached one by one with the back of curved scissors, and the denuded parts afterwards dressed with the following liniment:

Bichloride of mercury . . . 1 gramme.
Glycerine . . . . . 100 grammes.
Alcohol q. s. to dissolve the sublimate and facilitate its incorporation with the glycerine.

As was anticipated, the mechanical removal of the crusts could not be accomplished at one operation. Every day a certain number were got rid of, and at the same time the exposed surface was dressed with the liniment.

No. 2 was not submitted to any treatment.

At this date M. Bouley, the Inspector-General of the Veterinary Schools, came to inspect our establishment, and I profited by his presence to show him our two patients, which he examined with much interest.

On June 30th No. 2, although it had not been subjected to any treatment, appeared to be nearly cured. Many of the crusts had fallen off, and where they had been the hair was growing fast.

With No. 3 there was less progress; on the trunk and the head the crusts had been removed, and the places had been dressed with the sublimate liniment, so that these parts were in a very satisfactory condition; but there still remained the paws to be attacked, and there the favous crusts were very numerous and adherent, and their removal threatened to be slow. The same treatment was continued during the 1st and 2nd of July.

Up to that date the two rabbits had continued to enjoy excellent health, and they had become larger. From the 3rd an unfavorable change began in No. 3; although it continued to eat, it was not so lively and was less vigorous than hitherto; it became thinner, and was also attacked with a severe diarrhœa. This serious complication was attributed to the absorption of the bichloride of mercury, the use of which was immediately suspended; but it was too late, the animal wasted more and more, and at length died on the morning of July 5th, certainly from mercurial poisoning.*

With regard to No. 2, we have said that it had not yet been submitted to any treatment, and that the disease appeared to be disappearing. In fact, on the 7th July all the *favi* on the face and ears had fallen off, and the skin had lost its irritability; instead of yellow crusts were epithelial lamellæ, exfoliating abundantly in the form of furfuraceous pellicles, and the hairs were shooting out actively.

Nevertheless, a recovery was far from being complete or radical. There were still on the paws, and especially at the root of the claws, crusts evidently of a favous nature, which did not appear likely to disappear without treatment. On the contrary, the disease was fixed on these parts and persisted most obstinately; the horny tissue of the claws was attacked, and these grew deformed, and were dry, brittle, and at last fell off; their interior was then seen to be filled with an

* The reader will remember that a short time ago, a medical man, Dr. Meeres, of Melksham, applied a parasiticide remedy which had corrosive sublimate for its base to the head of a child, but the mercury became absorbed, and the patient died from the effects of mercurialisation.—G. F.

enormous quantity of spores. Finally, a very fine cup was formed on the external border of one of the ears.

Such was the condition of the animal on the 1st of August, when it was decided to put it under treatment; this time it was an ointment of the nitrate of mercury (nitrate 1 part, lard 50 parts) to which we had recourse.

It is necessary, then, to add the rabbit to the list of animals capable of contracting the *favus*, and the preceding triple observation proves that in it the disease may become very serious, for two of the three patients died; one very probably, it is true, from the effects of a too energetic mercurial treatment, but the other as certainly from the disease alone. The character of the affection, as we have endeavoured to describe it, is undoubtedly sufficient to authorise its being completely identified with the favus of man and the other animals; nevertheless it was not deemed useless to prove this experimentally. This I have done in transferring the disease from the rabbit to the dog.

3. *Transmission of Tinea from the Rabbit to the Dog.*

On June 14th, 1869, having a young dog at my disposal, aged from 16 to 18 days, I resolved to transmit the Tinea of the rabbit to it. Consequently, I took from the skin of rabbit No. 1, which had died the previous evening, a favus crust; this I broke up in some drops of distilled water, and spread the mixture so prepared, drop by drop, on the previously moistened head of the puppy, gently rubbing the epidermis at the same time with the pulp of my finger to make the spores penetrate beneath the hairs and insure their coming into contact with the skin. After this operation the creature was kept in the arms a few minutes to allow the part time to dry, it was then put beside its mother. It was examined every day, in order to note the result of this inoculation, or rather *sowing*.

On June 18th nothing was yet observed of the germination of the cryptogam. The sown surface was sprinkled with some drops of distilled water, and gentle friction, sufficient to damp the skin thoroughly but not disturb the seeds, was employed. On the 26th no trace of favus could be found on the puppy's head; but on the 27th, on examining it very attentively, three tiny, very characteristic cups, quite concealed by the hair, were discovered. They were arranged in a straight line drawn from before backwards to the neck. The first was situated in the middle of the line that joins the two ears, the second a little behind this, and the third at the point where the head and neck are articulated. These

three favi were a centimètre and a half apart from each other, and were already the size of a small lentil; their surface was markedly depressed, and they were each formed by a yellow dry crust, which slightly cracked and was strongly adherent to the skin. Some few hairs traversed these crusts. From their dimensions they must certainly have existed for several days, but they had escaped observation through the somewhat long hair concealing them so completely that even when their presence was divulged it required some looking to find them. A microscopical examination proved them to be composed of the same elements as the *Achorion*.

I showed these favi to M. Bouley, the Inspector-General, who readily distinguished their presence and the characters I have enumerated in this description.

The inoculation made on the 14th of June was therefore completely successful by the 27th; and if we consider that, to judge by their volume, these favi must have been three or four days old when discovered, we arrive at the conclusion that the time necessary for the spores of the *Achorion* to germinate and multiply is about ten days. This agrees with my preceding experiments.

Unfortunately, we were not allowed to follow the complete evolution of the malady; unknown to me, an experiment of another kind was practised upon the dog, and from this it succumbed on the 28th of June.

However, this experiment leaves no doubt as to the transmissibility of the disease from the rabbit to the dog, as well as the perfect identity in character of the eruption evoked on the skin of that animal with that elicited by our preceding experiments.—(*Journal de Méd. Vétérinaire de Lyons*, Sept., 1859.)

(*To be continued.*)

CENTRAL VETERINARY MEDICAL SOCIETY.

(OFFICIAL REPORT.)

MONTHLY MEETING, *Thursday, Dec. 7th*, 1871.

IN the absence of the president, Mr. F. J. Mavor, one of the vice-presidents, occupied the chair.

The secretary read four applications for fellowships, viz.: Mr. J. Cheeseman, M.R.C.V.S., Wandsworth; Mr. R. Moseley, M.R.C.V.S., Dorset Square; Mr. Chas. Lawrence, M.R.C.V.S., Bow; and Mr. Ely East, M.R.C.V.S., Curzon Street, May Fair. The election by ballot will take place at the next meeting in January.

Mr. Wm. Field, jun., laid on the table the brain of a horse

exhibiting a large tumour upon the choroid plexus within the left ventricle, and the advanced formation of a second within the right cavity. The animal, an aged gelding, was in perfect health up to one week prior to his death, and had been ridden regularly to hounds, as well as in the park, &c., by a lady, and throughout the course of his life had never shown any signs of disorder or interference with the functions of the nervous system. On the day when attention was first directed to him, he had reared violently while being saddled, and fell backwards in the stall, after which disease of the brain became daily more pronounced, and it was determined to have him destroyed. Mr. Field considered the occurrence of such disease to be unusual, when animals so affected were able to continue their work and appear in perfect health, and at the same time afforded no means of providing relief by treatment.

The *Secretary* stated that horses were more frequently affected in the manner shown by the morbid specimen before the meeting in the North of England and Scotland. Vertiginous signs, known as megrims, are usually associated, which have caused such animals to be called "shiverers." In consequence of the frequency of the disease in horses, the late Professor Dick treated the subject in a special manner in his lectures. He (the secretary) had known horses so affected to live, and work well for years; but, gradually getting worse, would eventually die in one of the severe convulsive fits, or so injure themselves as to become useless, when they were destroyed.

Mr. F. J. Mavor exhibited a specimen of lacerated tendon, upon which ossific deposit had formed. Previous disease had also been set up by the insinuation of thorns within the substance of the tendon, and the specimen became doubly interesting, as well as showing the nature of the lesion and mode of reproduction of substance.

Two specimens of nervous structure showing perfect reproduction after division and abscission, were also produced—one the nerve restored, and the second a prepared section for examination under the microscope, in which the true nerve-structure could be distinctly recognised in the new formed material. Mr. Mavor said this had been carefully dissected from the leg of a horse which had been unnerved for lameness of the foot. At the time, and for two years after, the operation enabled the animal to travel with perfect freedom from suffering, and at length, sensation returning, he was destroyed. The occurrence was attributed to the reproduction of nerve substance, which after death was found to be correct.

Mr. W. Field, jun., said he had found the same take place in horses he had unnerved, and upon which he always operated again.

Mr. Joseph Woodger, sen., reported several instances of a like nature, in which the reproduction of nerve-substance was unquestionable. He had generally found the substance, which had formed between the divided ends of the abscised nerve, to be greatly enlarged and always sensitive. After removal the animal again became sound.

Mr. W. Hunting said that he thought the reproduction of true nerve-substance was no longer a question of doubt, and referred to an instance where, in the removal of a tumour from the thigh or buttock of a man, paralysis followed; but, in the process of time, the use of the limb was again complete. From this it was decided that a portion of the nerve had been removed with the tumour, by which the power of movement was lost; but by subsequent reproduction of nerve-substance, function was always restored.

The subject was kept before the meeting for a considerable time and thoroughly discussed; and the decision was general that nerve-substance, notwithstanding the previous teachings to the contrary, is frequently reproduced, and that where portions of a nervous trunk have been removed to deprive a diseased part of acute sensation and lameness, both are eventually likely to recur from that reproduction at a period varying from two to several years.

MR. FLEMING'S INAUGURAL ADDRESS.

(OFFICIAL REPORT.)

In assuming, for another year, the honorable and distinguished office of President of the Central Veterinary Medical Society, I cannot permit the opportunity now offered me to pass, without endeavouring to express, as best I can, the intense degree of pleasure and pride which I experience in being unanimously re-elected by you to occupy this chair for a second official period in the existence of our young society, and to aid in forwarding your aims and noble aspirations in our important department of science. I shall always esteem this mark of your confidence in my humble abilities as one of the most cherished honours that could be bestowed upon me, and especially as I had, and have now, grave doubts as to the judiciousness of your selection.

The position of President of your Society—composed as it is of the *élite* of the profession—must ever be one of those honours most to be coveted by any veterinary surgeon who has the welfare of his science really at heart. Eschewing all political questions, and dealing only with those which are related to comparative pathology, you have combined yourselves in a friendly and laud-

able spirit, firmly determined to enhance, exalt, and extend the science whose study and practice you have adopted as your life task. This determination, and the devotion with which it has been already carried out, is at once an evidence that there are motives prevailing among you which are far more sacred and ennobling than those based upon a worldly desire to accumulate wealth which enriches not the mind, or those which induce a search after material pleasures that elude the grasp of the slaves who spend their lives pursuing them, or even those motives that cause many men to indulge in the jealousies, contentions, and narrow-mindedness of party strife.

Societies, like yours, which have for their principal, if not their sole object, mutual improvement, and the perfecting of certain departments of knowledge, ever command the admiration and sympathies of good men; for human progess, and the material, no less than the intellectual prosperity of nations, are intimately dependent upon their influence and their sustained efforts.

Therefore it is that I feel justly proud of being called a second time to preside over your deliberations and discussions, and to share in your labours, and the pleasure and profit to be derived from them. I shall endeavour to manifest my appreciation of the great honour you have done me, by carrying out the duties pertaining to the office I now hold, with all the zeal and ability of which I am capable.

But, gentlemen, if I experience a large amount of gratification in alluding to this matter, there is another which inspires in me, and, doubtless, in yourselves also, a degree of gratification which may well cause us to exult; this is the condition in which we find our Society after its one year's existence.

When, little more than twelve months ago, you resolved upon its formation, grave suspicions may have been, and, no doubt, by some were, entertained, that it must be short-lived, even if it survived the effort necessary to commence it. And the most sanguine among ourselves, though, perhaps, entertaining no fears for its longevity, could scarcely venture to hope for more than one meeting of the Fellows every three months—at least for some time. Yet what do we find has been the result of your energy and zeal? With only one exception, we have had monthly meetings, at which the average attendance was very large, the subjects brought forward being of great importance—a fact sufficiently evident by the attention they received; while the thoroughly scientific and amicable manner in which they were discussed, reflected the highest credit on the Fellows, and augured well for the success of future meetings. And as for the premature decay of the Society, the increase in the number of Fellows, the excellent basis upon which it has been founded, and the generous spirit

of emulation and zeal which pervade all who are connected with it, as well as its flourishing financial condition, falsifies any such prediction, and, on the contrary, leads to the inspiriting inference that it will continue each year to increase in strength, utility, and influence. Already, in one brief year, it has achieved wonders, and its success is perhaps unexampled in the history of societies in our profession.

To each of you, individually, this success is due, but more especially to the office-bearers, who, with your hard-working secretary and treasurer, deserve thanks and commendation for their efforts to bring matters to this prosperous condition.

Such, then, gentlemen, is the aspect of affairs on resuming our meetings for a second year, and they are certainly encouraging. But let us remember that they are only encouraging so far as to carry us on to renewed efforts. Last year, our society was too young, too unformed, to permit us to venture beyond a very elementary course of scientific business, and we dared not attempt to impose upon ourselves more than we could carry out with every prospect of perfect success. Until we had put the new machinery of the Society into motion, and tested its working and its powers, it would have been dangerous to throw upon it all the strain it was calculated ultimately to bear. Gradually we must be content to move, but move we must, ever forward. The year now commencing must see an advance on last year, and to judge from the past as to what may be attained in the future, we have every reason to predict great progress. We must keep in mind the words of Macaulay, when he is speaking of the New Philosophy:—"A point which was yesterday invisible is its goal to-day, and will be its starting-post to-morrow."

The chief aim of such a society as ours is definite and important. It is to promote the science of Comparative Pathology, which has for its objects to elucidate the diseases of the domestic animals, to trace the affinities of these diseases, to seek for the causes upon which their development depends, to remove these causes, or protect the creatures from their operation, if not removable, as well as to preserve the lives of valuable animals when affected with disease, and restore them to utility by every means that may be devised—such is the duty this science imposes upon itself. And to fulfil this duty worthily, what a demand there must be for patience, erudition, enthusiasm, and unflagging observation; indeed, the very highest mental qualities, aided by a knowledge of many accessory sciences, must be enlisted in this task.

But, gentlemen, knowing well the abilities of those who compose the Society, I have no fear that the subjects undertaken will not be efficiently examined and discussed, or that light will not

be thrown upon matters which are now obscure. Hearty co-operation, and an unflinching desire to achieve success, must have their due reward.

In such a profession as ours, which is yet in its infancy in this country, the amount of work to be accomplished is almost sufficient to daunt the stoutest heart, contending, as it must do, with many difficulties that appear to be all but insurmountable, and labouring to obtain advancement under every discouragement. The fact is, veterinary science, for reasons which need not be alluded to here, is not understood in Britain, and is but little valued; veterinary surgeons are only too often, in some respects, looked upon as but little, if at all, removed from the illiterate farrier or cow-leech, and their sphere of utility is generally supposed to be limited to administering a drench to a cow, a dose of physic to a horse, or some such trifling operations as castration, or firing the limb of a broken-down animal; and not unfrequently they are confounded with horse-copers, general jobbers, frequenters of race courses, and the associates of betting men and bookmakers on racing events; in fact, anything but educated scientific men, who respect themselves and their profession.

This, gentlemen, is a most unjust light to view us in; and if our profession has perhaps furnished more than a moderate proportion of men who have disgraced it, and retarded its advance, yet surely the science of comparative pathology is one deserving of public attention and encouragement, and its hard-working respectable students, as a body, ought to be exempted from the disgrace which should only be awarded to individuals.

If anything more than another could show how very little legislators, and the public generally, understand the capabilities of veterinary science to confer signal benefit upon the country, it is in the manner in which contagious diseases have been allowed to revel almost at will over the land for a number of years, causing an amount of destruction that is truly appalling. Nothing could be more deplorable than the reckless manner in which maladies, readily amenable to sanitary police measures, are allowed to spread, and to inflict heavy loss and serious inconvenience, merely because the country appears to ignore veterinary science, or is too apathetic to insist upon proper sanitary laws being introduced. The present condition of affairs, and the absence of any efficient veterinary organization for the suppression of contagious maladies among the valuable animals of this country, reflects the greatest disgrace upon us as a nation. Our system of inspection is a complete farce, and a delusion. The public do not seem to know that the true aim of veterinary science is the prevention of disease, and that a scientific organization, like that of enlightened continental

nations, would spare us from the devastation wrought by maladies which owe their presence and diffusion solely to contagion. Would not our Government be conferring a far higher boon on the nation, and adding far more largely to the national prosperity, by inquiring into the condition of veterinary science in this country, and the best means for improving it, and also for suppressing these animal plagues, than spending sessions on measures which can be productive of but little, if any benefit, or squabbling over Ballot and other Bills which are a mere waste of legislation, and have no really practical or beneficial influence on the welfare of the country?

But, gentlemen, we must not blame the public altogether for their neglect of veterinary science; we must largely blame ourselves. We have not always commanded attention by the means we have resorted to to improve it, and in many respects we have treated it so indifferently as to have degraded it from its high position. The education of veterinary surgeons has been faulty and imperfect in the extreme; and the mere fact that an untrained youth can, in twelve months' schooling, be manufactured into a man of science, competent to give advice on important matters relating to subjects which, in other countries, require and receive four years' study, is surely enough to show the miserable footing upon which our profession stands in this country. Can we wonder that policemen and farriers are, in very many instances, preferred to deal with the suppression of contagious diseases, or that quacks should flourish everywhere? Our teachers should be highly educated scientific men, capable of, and not averse to mixing in scientific circles, and selected as teachers solely because they are eminently fitted to be so; the veterinary schools should be reorganized, aided by Government, and subjected to periodical inspections, like other public establishments; the teachers should have no pecuniary interest in the number of students who enter or leave the schools; while the students themselves should possess a general education that would enable them to enter upon and pursue their studies profitably, and fit them for assuming the position they ought to hold in public estimation, when, after a thorough training at college, they shall be deemed perfectly capable of doing their duty as scientific veterinarians. When the time arrives, gentlemen, in which we shall witness this change, we will have no need to blush in confessing ourselves to be veterinary surgeons, nor yet reason to complain of neglect as a profession, nor will our country present the spectacle it now does with regard to quackery, and the havoc wrought by contagious and other diseases. Veterinary science, as already mentioned, may be said to be unknown as such in Britain. When the period arrives of which we speak, it will be highly appreciated for the benefits it confers, and its

disciples will have no occasion to fear the competition of quacks, or to lament their neglected condition.

But I gladly leave this unpleasant portion of my address, to return to our own more immediate business. As you are aware, a Diploma of Fellowship has been prepared, and will be issued to each Fellow and Honorary Fellow of the Society, and I trust the day is not far distant when this token will be as highly prized as any that is given by the best societies in our country; if we are only true to ourselves, and actuated by a proper spirit, this hope will be realized before long. We must labour to stimulate a desire for progress, and to foster a talent for observation. Our science is one which so relies for its improvement upon the powers of observation of those who follow it, that it might be said to be entirely a science of observation. We must encourage those whose efforts in this direction are worthy of encouragement. Hitherto, in our profession, we have been more successful in discouraging than encouraging. That jealousy of success in others, and that spirit of intolerance which cannot suffer any one to venture beyond the boundaries which a low standard of education and an uncultured intellect engenders have had their pernicious influence in retarding improvement and disheartening earnest workers; while the baneful effects of evil example have not been less fruitful in preventing such a development of veterinary science in Britain, as would long ago have placed it beyond the reach of cavil of other professions. This, gentlemen, through your influence and well directed efforts, should be changed. Your Society should be ever ready to acknowledge the services of these, let them be members of the profession in our own or in other countries, who benefit the profession and the public by their labours. This generous recognition of merit has ever been found to be productive of the greatest good, and has stimulated industry and research, while it has given a new impulse to talent and zeal.

I do hope, gentlemen, that this Society will, before long, take into consideration the propriety—I had almost said the necessity—of instituting rewards or other suitable recognition for those who labour or who have laboured successfully to improve veterinary science; a society's medal would form a most appropriate mode of reward, and in no way could we more signally testify to the spirit which has led us to form this society, than by adopting some such course.

I must now conclude this brief address, in which I have endeavoured to lay before you the thoughts that were uppermost in my mind in finding myself again among you.

I have spoken plainly with regard to some points which require plain speaking, and I have done my best to encourage and stimulate. I have been, throughout my professional career, impressed

with the need there is for every one to look upon his profession as he would upon religion—as something too sacred to neglect or be indifferent about. In labouring to become a proficient in it, the student is unconsciously, perhaps, elevating his own mind, and in doing so is achieving the highest duty he can towards himself; while he is adding his mite to the increase of human knowledge, is serving his country in a most beneficial manner, is diminishing pain and suffering, and conferring dignity upon his science. Besides, in the words of the great philosopher Carlyle, we must remember that "there is a perennial nobleness and even sacredness in work. Were he ever so benighted, or forgetful of his high calling, there is always hope in a man that actually and earnestly works; in idleness alone is there perpetual despair. Consider how, even in the meanest sorts of labour, the whole soul of a man is composed into real harmony. He bends himself with free valour against his task, and doubt, desire, sorrows, remorse, indignation, despair itself, shrink, murmuring, far off into their caves. The glow of labour in him is a purifying fire, wherein all poison is burnt up; and of smoke itself, there is made a bright and blessed flame. Blessed is he who has found his work; let him ask no other blessedness; he has a life purpose. Labour is life. From the heart of the worker rises the celestial force, breathed into him by Almighty God, awakening him to all nobleness, to all knowledge. Hast thou valued patience, courage, openness to light, or readiness to own thy mistakes? In wrestling with the dire brute powers of fact, thou wilt continually learn. For every noble work the possibilities are diffused through immensity, undiscoverable except by faith. Man, son of heaven! is there not in thine inmost heart a spirit of active method, giving thee no rest till thou unfold it? Complain not. Look up, wearied brother. See thy fellow-workmen surviving through eternity, the sacred band of immortals."

Gentlemen, let us conduct our business in the same spirit and in the same orderly manner which have marked our proceedings during the past year; let us aid each other to the best of our ability, and cultivate a generous forbearance from argument for argument's sake only. But let me not be thought for a moment to be opposed to argument, when the elucidation of truth is concerned, or when benefit to each Fellow is likely to accrue. On the contrary, by discussion and argument we must mainly rely for these advantages which are to be derived from our meetings. Milton tersely writes:—"Where there is much desire to learn, there will of necessity be much arguing, much writing, many opinions—for opinions in good men are but knowledge in the making."

I have now only to thank you all for your kind and fraternal

aid in carrying out the duties of this chair, and for the respect you have shown towards it. I ask you now to continue to extend to me the same favour and forbearance, and to do your utmost to make our Society what it should be—a permanent and influential institution among the world-renowned societies of this great metropolis. The generations yet unborn will fervently revere your memories for the good work you so brilliantly began and continued. To live for ourselves alone, or only for our own time, is a narrow view of our position. In the words of the poet :—

> "So should we live that every hour
> May die, as dies the natural flower,
> A self-reviving thing of power.
> That every thought and every deed
> May hold within itself the seed
> Of future good and future meed."

The attention of the meeting was occupied for a considerable time afterwards, by the consideration of some observations made by Mr. F. J. Mavor, on the Use of the Thermometer in estimating the progress of disease in the lower animals, and his suggestion that the subject might be taken up in a spirit of investigation and research by the Fellows of the Society. The importance of this branch of study, and the valuable information which is to be gained by it in the estimate and treatment of disease, were specially advocated by Messrs. F. J. and A. Mavor, J. R. Cox, J. Moore, sen., the President, Secretary, and others; and before the meeting concluded it was decided to remit the matter to the Council of Management, for the appointment of a committee of investigation, who are to be intrusted with the task of instituting a series of observations and experiments, the records of which will be brought before the Society when the labours are sufficiently completed to admit of useful results being obtained.

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

The Twentieth Meeting of this Association was held at the "Midland Hotel," Derby, Nov. 28th, 1871. The president, F. Blakeway, Esq., of Stourbridge, in the chair.

There were present, Messrs. Carless, Stafford; King, Melbourne; Pyatt, Nottingham; Poyser, Ashbourne; Reynolds, Mansfield; Rossell, Sandiacre; Coleshaw, Derby; and Proctor, Coventry.

The minutes of the last meeting were read and approved of.

Mr. King spoke in eloquent and feeling terms of the lamented death of the late Professor Spooner, and concluded by proposing that a letter of condolence be sent to the widow from the Association, which was seconded by *Mr. Pyatt*, and carried unanimously.

Mr. Blakeway proposed that a letter should be sent to Mr. Barry, the late Honorary Secretary of the Association, conveying the thanks of the Society for Mr. Barry's valuable services, which was seconded by *Mr. King*, and carried unanimously.

Mr. King proposed that a paid secretary to the Association should be employed; this was seconded by *Mr. Blakeway*, and carried unanimously.

A circular from the North of England Veterinary Medical Association, and a letter from Mr. Meike, the Honorary Secretary, were read, when it was proposed that the circular should be carefully discussed at the next meeting of the Association, which will be held in Birmingham, on the last Tuesday in March, 1872.

Mr. Carless, of Stafford, then delivered an address on the "Castration of Animals," in which he described the various methods of securing the animal, and performing the operation. The address was a thoroughly practical one, and excited the greatest interest among the members present.

A vote of thanks was proposed to Mr. Carless by *Mr. King*, and seconded by *Mr. Pyatt*.

Mr. Reynolds proposed a vote of thanks to the President, which was seconded by *Mr. Carless*.

The meeting then separated.

A. B. Proctor,
Honorary Secretary pro tem.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

The Thirtieth Quarterly Meeting of the Liverpool Veterinary Medical Association, held in the "Medical Hall," Hope Street, on Friday Evening the 10th November, 1871.

Tea was discussed, and the chair was taken by the President shortly after 6 p.m.

Present—J. Storrar, Esq. (President), of Chester; Messrs. Remy, Elam, Heyes, P. Ellis, Leather senr. and junr., C. Speakman, S. Littler, G. Morgan, R. S. Reynolds, Ackroyd and Harwood, of Liverpool; Whittle, Worsley, Woods, Wigan; Roberts, Oswestry; Jos. Welsby, West Derby: Lowe, Bolton; Barnes, Malpas; Dobie, Birkenhead; and T. Greaves, Manchester. Letters of apology were read from the following gentlemen:—

Messrs. Nuttall, Preston; Danber, Angleton, Hutchinson, Leyland, W. Lewis, Crewe; P. W. A. and J. A. Taylor, Manchester; C. Dyas, Dorrington; and W. A. Cartwright, Whitchurch.

Mr. Henry Barnes, of Malpas, then read a very interesting paper on "Black Quarter," which elicited a very lively discussion in which all present joined. Mr. Leather believed that the disease was due to poverty of the blood, and that the class of animals generally attacked were starved ones. Mr. Dobie, however, disagreed with Mr. Leather, and has found in the course of his practice the best of the herd most frequently suffer, thus corroboating the opinion of the essayist. Setoning in the dewlap is very successful as a preventive. Mr. Lowe has no faith in setoning as a preventive, but recommends bleeding in the spring, and an occasional purge, and has been very successful in treatment by making incisions in the skin of the affected part, dividing the cellular tissue and injecting violent irritants, bleeding and administering cathartics, following up with stimulants. Mr. Welsby, while admitting the use of setoning as a preventive, would like to hear from the meeting the theory of its action.

Mr. Storrar had seen cases of black quarter after setons, but they occurred where only very little inflammation had been set up, in consequence of inattention. He therefore advised their use. He believes black quarter to arise from a deficiency of fibrine in the blood, and the great amount of inflammation set up in the part by setoning arrests the growth of the animal for a time, and forms an outlet whereby the serous fluid is eliminated, thus giving the animal time to regain a certain tone. For, in his opinion, the disease is most prevalent in animals of too rapid growth, especially those which have suffered previously from debilitating diseases, such as diarrhœa. A steady system of feeding, to insure if possible a steady growth, is the best preventive. Mr. Whittle corroborated the Secretary as to distension of rumen being frequently an aggravating symptom necessitating the use of the trochar. Mr. Whittle has seen the disease in a milch cow, which was agreed to be of very rare occurrence. He has never lost any of his own rearing from black quarter, but has frequently suffered the loss of animals sent out to graze, after returning. After a few more remarks from Messrs. Elam and Greaves, &c. &c., the discussion terminated. The Secretary proposed and Mr. Woods seconded a vote of thanks to Mr. Barnes for his instructive paper, which was duly carried and acknowledged.

Mr. David Rowlands was elected a member of this Association. On the motion of Mr. Storrar, seconded by the Secretary, Mr. Dobie nominated for election Mr. W. Leather, and Mr. Ackroyd nominated Mr. S. Littler for members of this Association.

The Secretary read his report for the past year. Votes of thanks were then accorded to the retiring officers. The President and Secretary being induced to retain office, were re-elected. Mr. Greaves thought it too much to expect Mr. Harwood to continue his services, which had been given to the Association for a number of years. He should therefore propose Mr. Woods, of Wigan, as Treasurer, which was seconded by Mr. G. Heyes, and carried unanimously. Messrs. Jos. Leather, W. Dobie and T. Roberts, were elected Vice-presidents; Messrs. Reynolds, Remy, Morgan and Elam were elected a committee to examine and report on the existing rules at next meeting, with the President, Secretary and ex-officers. Mr. P. Ellis arriving late, after being unavoidedly detained, promised his essay on "Parturient Apoplexy" for next meeting, which will be held in the usual place the second Friday in February, 1872.

W. C. Lawson,
Hon. Sec.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

EPIZOOTIC AND ENZOOTIC DISEASES IN THE HORSE.

(*An Essay read before the Yorkshire and other Veterinary Medical Societies, by* Mr. Thomas Greaves, M.R.C.V.S.)

Our age is marked by a spirit of inquiry, directness of aim, and the skilled power to do the work required of us with completeness and economy; nothing that has been done is lost; invention awakes invention, discovery leads to discovery, each advance is a starting point for the future labourer, and thus we find better work, more simple, and more to the purpose, yet much more remains to be done. The ship, the bridge, the rail, the telegraph, and the gun of the present day as compared with the past are types, and mark the skill, precision, and advancing energy of the present time. Medicine, too, partakes of this movement that is going on all around us. The knowledge of disease is becoming more accurate and more extensive. Each year gives us better ideas of what medicines can do, and what they cannot do. If the spirit of scepticism has shaken the belief of a few in the medicinal means at our command, that spirit has aroused inquiry, converted belief, which is shifting, into knowledge that is secure. Thus our knowledge of disease ripens, and our aims in its treatment become more and more precise and vigorous, and all men ask themselves at each step they take, why they do this or that; reason takes the place of routine, and rational medicine becomes the common property of the profession. But there are still many of us who cling to doctrines that have long since been exploded, and follow customs that are unsuited to existing

circumstances; we are too apt to ascribe an exaggerated and mystical significance to medicine. Whatever may be the particular line of treatment for disease, the influence of that treatment on the disease itself is less than the practitioner is apt to think. The great majority of diseases tend to get well of themselves, if only the delicate operations of nature are allowed full play. Treatment cannot change their nature, cannot expel them at once; cannot quench, materially shorten, or prolong their existence; in fact, I am inclined to the opinion that no medicine of itself ever did cure a disease (any more than splints and bandages can set broken bones); they may stimulate nature to quicker and more effective action or the reverse. When we contemplate the abominable adulterations, and vile combinations of drugs, and call them medicines, we find they often destroy health and produce disease. Can we conceive a greater exaggeration than the homœopathist's millionth part of a grain curing a malignant disease? We strain all our faculties to the utmost, and call art and science to our aid in acquiring knowledge, and we thus use it when we have got it; we plough the ocean and girdle the earth with our ships, and sink a thousand human lives annually in deep sea graves to bring to our help drugs from other climes to cure disease, and we use them thus when we have got them. The thoughtful practitioner, with nearly a complete knowledge of the natural changes through which the disease passes from its beginning to its end, knows with tolerable precision how far he can assist nature in her efforts to overcome it. Depend upon it, our intelligent employers believe it is our duty to know and to apply general principles as well as to know and apply medicine. Every veterinary writer of eminence lays it down as a rule that it is as much the practitioner's bounden duty to bring his knowledge to bear in preventing the entrance or development of malignant diseases as in the arresting and curing them. Blaine says, "There is, however, one point of medical treatment which is perhaps of even more importance than the cure of disease, viz. that of prophylaxis; this is of the very greatest importance." I consider that when we are learning this lesson we are studying the highest truths in science.

Glanders, farcy, and influenza in their various forms may be considered the chief epizootics and enzootics to which the horse is liable. Influenza assumes several distinct aspects, differing in many essential particulars from each other; thus at one period we have a run of cases in which the leading characteristic is extreme nervous debility and prostration following immediately on the attack. This form of malady may continue for six or twelve months, and then subside without any evident or apparent reason, as though the cause had expended itself; we may be for years free from any disease partaking of an epizootic character, then all at once we have a number of cases with symptoms very different from the former, but still coming under the denomination of influenza; these cases may have a great tendency to œdema in the eyelids, closed eyes, with the anterior chamber containing lymph; the extremities much

swollen, with great tenderness in them. This type of disease may continue six or twelve months, subside we know not how, or why, and we may have again a long period of absence of cases of an epizootic kind, when all at once we have numbers of cases with sore throat and profuse discharge from the nostrils; some of the worst kind have a straw-colour or yellow discharge. This form is sometimes called epidemic catarrh; we may have a run of this for several months, and it, like its predecessors, will subside without any evident or definite reason. Again we may be comparatively free for a time, when all at once there will occur one and then another, and then a run of cases in which the organs of respiration are chiefly affected by a low inflammation, constituting what is sometimes called chest influenza. This last is by far the most serious type of the epizootic, and requires the deepest and most attentive consideration; these cases progress insidiously. At length the disease subsides, like its predecessors, we know not how or why; but, as in the previous visitations, it would appear that the cause, whatever it may have been, had become less and less virulent, and had in the end entirely expended itself; in fact, the history of every epizootic and every epidemic they have their entrances and their exits in a similar way. The fact of a disease existing in particular localities is not certain proof of its being either infectious or contagious; these terms seem not to be rightly understood by most persons. The spread of disease is often a result of some local causes wholly apart from and independent of infection.

From researches of eminent men, such as Professor Huxley, Professor Tyndal, Dr. Angus Smith, and others, who have given much time and close attention to the subject, we have scientific knowledge developed and placed in our possession in advance of anything known before on the theory of germs, dust particles, and fungi existing in the atmosphere, and their power in producing disease; they have shown that the germs or fungi in which the virus of cholera and cattle plague is known to exist, acquire at times, as do the germs of other contagious diseases, an unusual power of reproduction; that such germs may be carried by man, or animals, or goods, or ships, or be scattered by wind to regerminate wherever specially favorable conditions are found.

Professor Simonds said that the infection of cattle plague was so virulent that if only a small quantity of the excreta of a diseased cow were carried on the point of a lancet from one end of England to the other, it would be quite sufficient to infect a whole herd; and further, that the laws on which infection depended were as inevitable and as incapable of change as were the laws that governed the universe.

Professor Tyndal has demonstrated that the germs (and germs are seeds or ova of living organisms) which are floating in the atmosphere can enter the system, and growing there produce various disorders; he has shown that in ordinary atmosphere in a dry room in which a fire or gas is burning, the particles floating in the air consist of fragments of coal, granite, vegetable, hairs, cotton

and wool fibres, a few starch granules, and occasionally a few spores of fungi.

Any morbid sprouting mould, musty fungoid growths upon walls, or boards, when acted upon by an increased temperature, and the fecundating power of light, are a fruitful source of these organic germs, or spores. The smut in wheat is an example; the black powder, minute as it is, every granule of it constitutes a spore; one square inch of surface would contain little less than 8,000,000. This parasitic fungus is a species belonging to the family from which spores in general emanate. The ergot, or parasite on rye, is another instance. There can be no doubt that plants infested by these minute fungi, used as food by animals or inhaled in respiration, often cause disease of a serious character.

Scientific researches bring subtle and mysterious phenomena within the pale of our comprehension, and blend them with common popular knowledge. Thus we find that Professor Tyndal propounds the theory of the dust particles dancing in the sunbeam, and shows its dangerous bearings. Eminent physicians propound the doctrine of morbid germs, and eminent botanists propound the theory of fungus spores. These learned men discourse on the origin of putrefaction and spontaneous generation of minute animals, which none but microscopists have ever seen, but which nevertheless do exist in the air as certain as man exists. As we study and contemplate these things, we feel it is a sure and certain indication of the advancement of science, and a great step over the ignorance and darkness of past times; still we can, as yet, no more understand these floating germs than we can how the perfume of a flower is diffused through the air, or how a grain of musk should give off its peculiar odour for the space of twenty years, and itself not become perceptibly diminished in bulk; we are equally unable to explain why, out of twenty persons breathing a loathsome air, one only will breathe in a fatal dose, and nineteen will escape the malarious poison. We have all experienced the stench of putrid ditches just before rain, when the air becomes charged with moisture, and we know how sensible the perfume of flowers becomes during the fall of the evening dew; when the air loaded with the odour from a field of beans in blossom, this may be perceived many fields away if you happen to be in a line with the wind from the beans. These instances are incontrovertible evidence of the essence of the blossom being supported and floated in the air and carried by currents of the wind. Perhaps you are ready to say, "Oh, yes; but there is all the difference in the world between these perfumes and deadly poisons; they cannot be communicated through the medium of the air." Now here, again, I would argue my point by illustration: Is it not a fact patent to all of us, that occasionally we are visited by blasts of wind sweeping over vast tracts of country, drying up the sap and shriveling up the foliage of almost every tree and shrub, missing only those in peculiarly sheltered positions? What is this but an acrid poison existing in the air? If only for an hour we see its effect, that is palpable to our senses; but we cannot ascer-

tain by our most scientific tests what it is. The virus is stirred up somewhere, floated and diffused in the air, carried by currents to considerable distances, retaining its power of destruction all the time. Nay, have we not an equally clear example in the deadly poison emitted from the leaves and bursting buds of the Upas tree? The criminal condemned to death has the chance given him to go to the tree and pluck a branch, by covering his entire body with varnish, and approaching the tree in the precise line with the wind and holding his breath. It is occasionally done in safety, but were he to approach it from any other point it is a million to one but that he would inhale by the lungs, or absorb by the skin, a fatal dose! Again, during the cattle plague, there are innumerable instances in which a healthy stock, separated from a diseased stock by a river, and where every possible precaution was constantly taken to prevent anything passing between them that could act as an agency of communication, that such healthy stock has kept healthy until a change in the wind has brought the contaminated atmosphere across the river, and the healthy cows have from that hour become affected! I contend that a virulently infected animal, like the Upas tree, is a centre from which poisonous emanations are emitted from the lungs, and exhalations from the skin permeate and float in the air capable of being carried to various distances, and infect other herds without any contact whatever. This is the mode by which I consider that infectious diseases are communicated; but time will doubtless reveal far more about these things than we know at present. An atmosphere surcharged with a morbific miasma may not be discernible by the nicest chemical tests, its presence is only inferred from its effects upon animal life; whether it be an excess or deficiency of oxygen in the atmosphere, an excess or deficiency of some of the other constituents we know not; but this we know, that there is a connection between the atmospheric air and the occurrence of putrefaction. Is not this proved by meat becoming almost immediately tainted under certain conditions of the air, while the occurrence of putrefaction is attended by the development of various low forms of life? Of this we are certain, that the air around us, especially that in damp, dark, ill-ventilated places, contains many floating germs of common fungus, possibly many germs of infinitesimal life, producing various forms of disease. Whatever it is that excites fermentation and putrefaction, and, at the same time gives rise to living forms in an infusion, is either a germ, microzymes and sporules of fungi, or matter divided into minute solid particles. Professor Tyndal has most clearly demonstrated it by this mode: if a fluid eminently fit for the development of the lowest forms of life, but which fluid contains no germs at the time, be exposed for a short period to the action of ordinary air, it gives rise to living things in great abundance; whilst, on the other hand, the same fluid if exposed ever so long to air which has been mechanically freed from these germs or solid particles, there shall be no such development of life in it. Professor Tyndal has thus clearly demonstrated that organic matter, capable of producing

putrefaction and producing living germs of animal or vegetable origin is contained in the atmosphere, although it is invisible and indistinguishable; and he shows further that if this ordinary air be passed over the flame of a spirit-lamp, the floating matter is no longer apparent; having been burnt up in the flame, it is no longer capable of developing animal life; it is therefore organic matter which is destroyed. The same disappearance of particles followed the slow passage of air through a red-hot platinum tube. These organic dust-particles would appear to be the rafts which support the contagium of an epizootic or enzootic disease, and thus it is floated by currents of air; for we find that a heated body which merely increases the temperature of the air, but does not consume it, expands; becoming specifically lighter, *it ascends*, but the organic dust-particles or germs are left behind, *below*. It is thus clearly shown that the life-giving germs, poison, or whatever it may be occupies the lowest stratum of the air. This is of the utmost importance for veterinary surgeons to know; it is nothing less than a practical means sketched out to us by which we may in future destroy both these adventitious matters and the contagium. I do not presume to say that an atmosphere entirely freed of this organic and inorganic matter would necessarily be more wholesome to be constantly inhaled by our domestic animals. It would seem that Professor Tyndal is of opinion that it would be beneficial, from the fact of his recommending cotton respirators, in order to free the air as we breathe it of all these impurities. I believe that there is not a place in which the atmosphere is wholly free from them, therefore it may be said to be its normal condition. But this is an ascertained fact, that whenever these spores or germs, or miasmatic veins, exceed a certain proportion in the air, it is abnormal, and in the same ratio is disease more or less prevalent and fatal.

Professor Tyndal has further proved the above facts by an ingenious experiment, viz. if you allow a strong ray of light to pass through a small hole into a dark chamber containing ordinary air, it is quite visible all the way across the chamber; this is owing to the refrangibility of the air containing solid organic particles or vibration of atoms, which become luminous as the ray strikes them; but if the air in this chamber is rendered perfectly pure by the mechanical removal of these solid particles and germs, the ray of light will be utterly invisible. This experiment shows that pure air is invisible by its own intense transparency. This is a proved and an acknowledged fact; it is a confirmation of the opinion formed by all scientific men, viz. that if man could be transported into that intense blue boundless space beyond the photosphere of this earth's atmosphere, where all is eternal breathless silence, he would find himself surrounded by absolute and impenetrable darkness. There being no atmosphere, no constituents of an atmosphere—nothing, in fact, for a ray of light to act upon, the rays would pass through that vast region utterly invisible.

I have already shown you that I believe each of the forms of influenza are dependent upon causes differing somewhat in their

nature, the one from the other; but as to that, is it not patent to every thinking man, that almost every epizootic and enzootic, as well as every epidemic and endemic, are dependent upon causes utterly distinct, and different from one another? The virus or germ that produces influenza will not produce glanders, and *vice versâ*, the virus or germ that produces cattle plague will not produce pleuro-pneumonia, and *vice versâ*. The virus or germ that produces either smallpox, yellow fever, cholera, scarlatina, &c., will produce only the specific disease it is destined to produce.

We will now suppose we have a case of chest influenza. The horse has been living in a stable in which the air is humid and confined; it is replete with putrid matter floating in the air, though indistinguishable. I will not say whether the particles are organic germs or virus poison, but I can easily conceive their effects to be of an acrid, caustic, inflammatory nature; and being inhaled, they adhere to and irritate by contact the delicate lining membrane of the air-cells, as definitely and as certainly as the inevitable effects of a nettle upon the back of the hand, the sting of a wasp upon the forehead, or the effects of scalding steam upon the skin. This is instantly followed by irritation, turgescence takes place to a greater or less extent, according to the intensity or mildness of the attack,—and this I hold is dependent upon the proportion of the deleterious matter in the air. At this stage the excitement in the lungs may readily be calmed and soothed, by at once placing the patient so that he must inhale pure and fresh air, and administer to him diffusible stimulants. At this particular point of my subject, there arises a most vital and deeply interesting question. I would call it a difficult physiological problem:

"*Have we Blood Poisoning?*"

I do not mean whether the deleterious ingredients existing in the atmosphere are subtle gaseous poisons, spores, or germs—that question we will waive; but do these deleterious ingredients which are existing in the atmosphere positively pass the barrier placed by our all-wise Creator in the membrane of the air-cells, and passing through it, really become commingled with the blood, poisoning that fluid, and entailing all the dire and often fatal consequence? I am aware many of my professional brethren hold that they do. I maintain the contrary opinion, especially in chest influenza in the horse, and in pleuro-pneumonia in the cow. I grant you that the constitution of any horse is weakened and rendered more predisposed to become attacked by any malignant disease, and if attacked is much more likely to succumb if he has been for some time previously living in, or sleeping in, an atmosphere in which these deleterious ingredients exist, so much diluted with fresh air as not to be able to create active disease; the blood has not imported into it a destructive slow poison, but has become gradually deteriorated and suffers, inasmuch as it does not receive its ample

supply of oxygen, or evolve its customary quantity of carbonic acid gas, and after a time it becomes more and more impure, poorer and poorer from this cause; but beyond this I contend we have no proof whatever that any poisonous ingredient has passed into the blood. I maintain that if the blood had received a deleterious ingredient sufficient to destroy life, it would leave a taint on every tissue of the body which it came in contact with, instead of which we have no evidence whatever of such being the case, whereas by adopting my theory that the deleterious ingredient does not pass the barrier, or become in any way commixed in the blood, but that it is stopped at the barrier, acts as a foreign body, at different centres in the lungs, at which precise spots we find the gray tuberculous hepatization, disintegration, vomica; these are the evidences I rely upon as proving it to be a decidedly local disease at commencement. Do you tell me that the sympathetic fever which is set up is evidence that there is poison in the blood? I say 'nay,' that is no evidence of it at all; have we not an equal amount of sympathetic fever when a man gets extensively scalded with pure steam, or when a horse runs a clean nail into his foot? would any man be so infatuated as to contend there must be poison imported into the blood in such cases? Surely not, and in my opinion the other case is precisely similar, although not so clear or easily understood.

We will now presume the horse has been breathing this impure atmosphere for some time; the air passages have become abnormally excitable, when some sudden or accidental cause, perhaps a little harder work than usual, a sudden check of perspiration, or inhaling a larger dose of this vitiated air all at once develops the active stage, the progress of endosmosis and exosmosis becomes suspended at several centres; if the progress is not arrested, hepatization, disintegration and vomica result; this putrefactive process is always evidenced by the intense putrefactive odour, and then it is that the aspiring and ambitious veterinary surgeon has to learn that hardest of all lessons, viz. the limits of possibility.

I verily and firmly believe, as science advances in our profession so will reliance on the action of medicine and counter-irritation become less and less in these diseases, and at the same time the current of men's thoughts will drift or be drawn by scientific investigation into another channel, and these diseases will be treated by atmospheric means, by causing such patients to inspire a purified air, possibly a medicated artificially prepared air, which will act directly upon the tissues, overcoming spasms or perverted action, and restoring normal action. I will give you an example of what I mean, by illustrating a case in point. I have been a great sufferer from infancy up to late years of violent attacks of acute asthma; the attacks usually took a similar course, and required three or four weeks for me to recover. The first three days the irritation in my air passages was so great that I had the greatest possible difficulty to breathe at all. During this period the continual laborious action of the intercostal muscles was such that the pain and suffering from nervous exhaustion was always indescribable. About the third

day I always commenced to expectorate, which would continue day and night for about three weeks; the tumefied delicate tissues seemed to exude the phlegm, and from this moment I experienced some relief. Now it so happened I was attacked by acute asthma once when visiting some friends in Yorkshire; I could scarcely breathe at all, and whilst gasping for life, the good people of the house commenced to burn paper and made me breathe over the fumes. In five minutes I experienced great relief. In twenty to thirty minutes the excitement and tumefaction of the bronchial tubes subsided, my distress was removed, and my breathing completely relieved. The paper had been prepared for a similar case; it was simple blotting paper, saturated in a strong solution of nitrate of potass, and dried. On numbers of occasions when I have been so bad that one might have thought I was at my last gasp, I have rushed down stairs in my night dress, placed my mouth as near to the fire as possible, and by breathing the rarified air in three minutes I have experienced a sensible relief; in twenty to thirty minutes I was no longer distressed, and my breathing was entirely relieved. In thirty minutes these means have by themselves on many occasions produced more marked and lasting results than any medical treatment whatever has ever given me in three weeks or a month.

We will now bring the practical application of these theories to bear on our daily duties, for I hold it is a perfect waste of time for scientific men to make discoveries, or for veterinary surgeons to be at the trouble of compiling essays and reading them before large bodies of veterinary surgeons, unless they can be utilized, and brought to tell beneficially on our daily life.

The first example I will give you will be the horses belonging to the Lancashire and Yorkshire Railway Company, Salford. The Company have from time to time been in the habit of converting arches into stables, and in one or two arches so converted about fourteen years ago almost every horse that was put into them was attacked with a very serious typhoid disease, in many cases ending fatally. It attacked new fresh horses, and also old, well-seasoned horses. The disease would run its course in fourteen or twenty-one days, always ending in vomicæ in the lungs, and effusion into the chest. I had recourse to every known expedient to change the condition of these stables; had the ventilation improved as far as practicable (I would remark here that no stable is properly ventilated unless it has two or more openings on the ground surface in opposite places, to admit a large volume of fresh air, and also a considerable opening at the top). The grids and soughs were taken up, perfectly cleaned, and put into thorough repair; frequent and thorough whitewashing, constant and strict attention to cleanliness, free use of disinfectants, even fumigations, not neglecting great care with the horses individually, were tried, but all to no use; fresh horses kept falling victims, and thus it had become a very serious matter. One day, whilst seriously revolving in my mind various schemes to check the ravages of the disease, feeling certain that it was caused by some poisonous malaria or organic germs in the stable, it forcibly occurred

to me (and the thought was entirely spontaneous) to recommend the employment of coal or coke fires in moveable grates in the stable, as close to the ground as possible, with a view to draw into them and consume the malaria, germs of fungi, &c.; the fires to be burned two or three hours a day, every day, for a fortnight. I must confess that I had considerable misgivings and diffidence in bringing my mind to this, being apprehensive that I might be ridiculed and laughed at, it being an entirely new mode of procedure; however, my suggestion was at once put into practice; the fires were moved from place to place in the stable. From that very day not another case occurred in those stables, and they have continued ever since that time as healthy as any in Manchester or Salford. Here we have, I think, evidence of an irresistible kind, that the cause, whatever that may have been, was removed.

The second example took place six or eight years after. In a stable at Bank Top, belonging to Messrs. Carver and Co.—it was a railway arch, which had been recently converted into a stable—almost every horse put into it (and there were thirty or forty valuable cart horses occupying it) became attacked with a low typhoid form disease very shortly after being put into it. Many of the horses were most dangerously ill; some died, and others on being at once removed with the greatest possible care and difficulty were restored. The horse manager said, "The stable is so unhealthy, I will never send another young or good horse into it." Well, we got fires into these stables, and grids a foot square in the walls on the ground surface at opposite points, as well as three or four large openings in the centre of the arch at the top. From that day the disease ceased, and ever since they have been as healthy as any stables in Manchester, both with new young horses and also with old seasoned horses. So thoroughly convinced are the horse-keepers and horse managers of the importance of fires, that they frequently have a fire burning in one or two stables whenever there is a season of wet weather, to dry the air and to keep them healthy, as they say.

The third example. At the beginning of December, 1869, I was requested by the horse manager of the London and North-Western Railway to go to London to examine a stable of theirs at the Broad Street station, which was considered an extremely unhealthy stable, and had been so for some time, or else the horses took cold during their work in a very lofty exposed situation, especially exposed to east winds, and being on a level with the top of the chimneys of the surrounding neighbourhood. I first was shown two horses which were attacked in this stable three or four days before with a malignant typhoid disease, and at once removed out of this stable (as was the custom) to one at a distance. I found these two horses affected with farcy and glanders; as such, I advised that they should be at once destroyed, which was done. The veterinary surgeon and his son said that these cases had degenerated into that condition only the last few hours, so malignant was the disease. We had then to go and inspect the place where they worked, and

also the stable. I found they had thirteen horses in the stable; they had replaced these thirteen horses twice over in seven months, that is, they had taken them out, horse by horse, as soon as they had become attacked, both seasoned and unseasoned horses alike, and sent another horse to work in its place. The majority of the horses so taken out had died, or had been sent to the dogs. I found the stables perfectly sweet, scrupulously clean, both floor, mangers, boskins, buckets, gears, grids, gutters, &c.; the horses also were looking well, and in a good healthy condition. They had used whitewash and disinfectants very freely, and had removed the sick horses at once as they were attacked, but all these precautions proved utterly unavailing in arresting the disease. I would here remark that unfortunately aerial poisons are perfectly inodorous.

I strongly recommended a free ingress of air by making a hole in the wall on the ground surface a foot square for ingress of fresh air, and improved ventilation at the top; and also ordered two fires put into it for two hours a day for a fortnight. This was done at once, and from that day up to the 1st of May, 1871, when I called there, they had not had a single horse attacked with the disease. They had had one or two horses with simple sore throats eight or ten months after, but these were only temporary cases. Here we have, I think, evidence of an irresistible kind, showing that the cause, whatever it might have been, was at once removed. I called them cases of putrid fever, produced by inhaling a putrescent air, though this state of the atmosphere was utterly imperceptible to the senses. But further than this, there were under the same arch, and the arch adjoining it, which was open with this arch by an arch between them, eighty horses belonging to Messrs. Chaplin & Horne; these horses have been replaced three times over in two years, in the same manner as the horses above alluded to. I recommended the same course to be adopted in that stable, but the authorities of that firm only ridiculed and poo-pooh'd it; they remarked, we might as well light a fire on the top of Chalk Farm hill for what good it would do. Well, observe the consequence; during the following six weeks they had six horses attacked and taken away out of the stable. They then adopted the method recommended by me, and from that day they have not had one horse attacked. Of the one thousand and odd valuable cart horses under my care belonging to the above three companies, we do not loose from sickness more than $1\frac{1}{2}$ or 2 per cent. per annum, taking one year with another.

The fourth example refers to the horses belonging to the Corporation of the City of Manchester. During last summer and autumn a very malignant enzootic was raging in their stables in Water Street. In August, the practitioner attending to them met me and invited me to go with him and see them. He showed me numbers of cases there on hand, some of them in a hopeless state, and took me through the stable, but did not on this occasion ask me for my opinion or advice, neither did I venture to obtrude it. On the 17th November I received a note from him requesting my attendance to make a post-mortem examination of a horse from the Corpo-

ration stables, that had died of this dreadful influenza. About this time he sent for me again to accompany him to make another post-mortem examination of two other horses from the same place. He told me they had lost many of their best horses; that there was scarcely a day but there was one or more fresh cases, and that they fully expected the disease would go through the whole stables. I then ventured to say to him that he ought to adopt preventive measures; he replied, he had already done everything that could be in that way; he had called in and consulted three of the most experienced veterinary surgeons in the town, and that notwithstanding a number of loose boxes had been built, and been in use for several weeks, and every fresh case had been immediately taken out from amongst the rest and isolated, nothing he could do seemed to arrest the disease. There had been three dead animals during the last eight or ten days; fresh cases kept occurring daily; that very morning a fresh case had occurred, so that it was quite natural to infer that the infection was as rife in the stables on that morning as at any time previous. He requested that I would meet him at the stables, and any suggestions I would make should be carried out. I met him, and the superintendent and horsekeeper joined us in the stable. He showed me ten or twelve cases; they had lost several others previously, as I was informed ten or twelve horses. The superintendent informed me they had lost fifteen horses, worth £50 each. I related several precisely similar instances I had been called to in London and elsewhere, where my method has been entirely successful. I then observed there is ample ventilation in the upper region of these stables, but in the lower region where the horses breathe, the ventilation is very deficient indeed; there ought to be openings here and there on the ground surface (indicating where they should be made) for ingress of a large volume of fresh air. I also recommended coke fires in moveable grates, to be burned in the stables, from stall to stall, and in the loose boxes, for an hour or two a day, for a week or fortnight, for the purpose of consuming the miasma or malaria which no doubt existed in the stables. This was done at once. At the expiration of a week's time the veterinary surgeon called upon me, and said, "Well, so far it is answering, it seems to be a success; we have not had a single fresh case attacked since we adopted your method, which has been carried out strictly." He did not on this occasion in the slightest degree allude to isolation having produced the change. At the expiration of three months I saw him again, when he informed me that there had not been a single fresh case since, and that those on hand had recovered, and at that time they had not one case of sickness on hand. Neither on this occasion did the word isolation ever once pass his lips, but to the pointed question I put to him as to what he attributed the change, he made me this answer, which seemed prompted by conscientious conviction, "Why, I think there can be no doubt about it, it is the fires and the changed ventilation." On the 22nd July, being eight months after my method had been adopted, they had not had one dead horse, or a single case of the

disease. Here again I think we have evidence of an irresistible kind, showing that the cause, whatever that may have been, was at once entirely removed.

I have two other examples that I could relate; they are parallel cases, and equally successful. I am fully convinced that in every large concern, whether it be of 'bus, cab, or other horses, the persons concerned may by an intelligent adoption of the above method rid the stables at once and permanently of any and every contagious or infectious disease, and I verily believe if in the days of the cattle plague and pleuro-pneumonia, every shippen was ventilated as above recommended, and had had a good open stove fire in it, and a few tablespoonfuls of petroleum or paraffin oil spilt upon the floor and burnt in each boose once or twice every day, the disease would in all probability have been greatly modified, if not entirely arrested. We are as yet but in the infancy of an understanding of the subject of aerial poisons. Only a little knowledge on this head might at times ward off momentous consequences. I look upon this as the highest truths of science that our profession can teach.

I believe there are those who would contend that these examples that I have narrated are great achievements, a triumph of science and experience. They are now laid before your notice, possessing as they do ample matter for reflection, great and most important facts for you to ponder over, especially as to the soundness of the doctrine of incubation. They are not—

"Baseless as the fabric of a vision,"

but are useful convincing truths, calculated to lead our minds to take broader views of our noble profession, making it more extensively useful. Thus it will be seen that as science removes the mists which obscure our mental vision, and circumscribe our knowledge, disclosing to us at the same time the awful grandeur of the truth as it exists around us in nature, will our senses become expanded and capable of contemplating and realising the wisdom, power, and goodness of our great Creator.

Veterinary Jurisprudence.

THE PROPAGATION OF CATTLE DISEASE BY RAILWAYS.

At the Birkenhead police court, December 4th, an information was laid against the London and North-Western Railway Company for using trucks for cattle without being properly disinfected. It was proved that on the 2nd of November two cows suffering from pleuro-pneumonia were found in one of the defendant's trucks, which was in a very filthy condition.

The defendants were fined £10.

FOOT-AND-MOUTH DISEASE.

A Dealer Fined £150.

At the Brentford petty sessions, on Saturday December 16th, a cattle dealer named Price Jones, of Abergele, North Wales, was summoned for having, on the 12th November last, at Twickenham, unlawfully driven along the highway ten animals suffering from the foot-and-mouth disease; also for having driven the said animals with a herd of 115 others along the said road.

John Thomas, servant of the former, was also summoned for having driven the said animals along the highway at the same time and place. The magistrates dismissed one of the summonses against Jones, viz. that having reference to the driving of the ten animals; but convicted on that of having driven the said animals in contact with 115 others not affected. They inflicted a penalty of £100; and in the case of Thomas imposed a fine of £50; in-default a distress; and in default of distress, three months' imprisonment each.

Defendants wished to appeal, but were informed there was no appeal. They did not pay the money, and left the magistrates to distrain.

NEW MEMBERS OF THE PROFESSION.

At a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons, held on December 18th and 19th, the following Students from the Royal Veterinary College were admitted members of the Body Corporate:

December 18th.

Mr. Oswald Sowell Blackett	London.
— John Morgan Rees	Llwynypiod, Caermarthenshire.
— Benj. Augustus White Powell	Plumstead, Kent.
— Walter Lomas	Hartington, Derbyshire.
— Richard Dewing Spinks	Heigham, Norwich.
— Rowland William Pitcher	Hellingley, Sussex.
— John Peacock Fotherby	Beckingham, Notts.
— George Parker Short	Torquay.

December 19th.

— John Edward Taylor	Ogden, Lancashire.
— Charles Joseph Philips	Maidstone, Kent.
— John Sansome	Hanslop, Bucks.
— Arthur Taylor	Nottingham.
— James Neild	Oldham, Lancashire.
— Thomas Moore	London.
— Thomas Bazley	Frome, Somerset.

At a special meeting of the Veterinary Board of Examiners, held in London, on October 18th and December 19th, in accordance with the resolution of the Council for the admission of Candidates holding the Highland and Agricultural Society's certificates, the following gentlemen received the diploma of the College:

Mr. John Gillespie . . . London.
Colonel F. Fitzwygram . . 15th Hussars, Mhow, India.

SMITHFIELD CLUB CATTLE SHOW, 1871.

Live Weights of the Cattle and Sheep.

CATTLE.

No.	Weight.			No.	Weight.			No.	Weight.		
	cwt.	qrs.	lbs.		cwt.	qrs.	lbs.		cwt.	qrs.	lbs.
1	10	1	2	60	20	2	25	115	13	1	10
2	13	2	11	62	17	1	16	117	18	0	17
3	10	1	16	63	18	0	20	118	19	3	0
4	11	1	4	67	19	1	16	119	17	1	4
5	11	1	18	68	21	0	18	120	17	3	20
7	11	0	2	69	17	3	8	122	17	3	18
9	13	3	20	70	19	1	0	123	17	2	22
10	13	3	25	71	15	1	0	126	15	3	20
12	11	3	3	75	13	2	7	130	18	0	17
13	12	3	12	76	17	0	0	131	17	0	4
17	14	0	2	78	17	2	4	133	16	0	22
18	17	1	14	80	14	2	20	135	16	3	0
20	15	1	17	82	17	2	24	137	20	0	20
21	17	1	16	83	17	0	20	138	15	3	18
23	15	2	10	84	16	3	2	139	16	2	24
25	15	2	10	86	15	3	2	140	20	2	26
27	16	0	9	87	16	2	30	141	20	2	4
28	18	1	20	88	15	1	16	142	18	2	7
30	12	3	22	89	15	1	25	143	15	3	4
32	15	1	23	90	17	1	22	144	13	1	2
33	12	2	13	91	15	2	16	145	16	1	22
34	15	0	10	95	17	1	8	146	16	0	22
35	15	0	11	96	18	3	3	147	16	0	3
36	16	0	9	97	17	0	8	148	17	0	12
37	13	0	22	98	25	1	16	149	16	0	0
38	12	2	6	99	21	2	6	150	15	1	18
39	14	0	8	100	18	3	20	153	15	0	10
41	14	0	0	101	22	1	26	154	16	0	10
42	11	2	4	103	20	1	9	155	15	0	8
43	11	2	4	104	23	3	16	158	20	2	13
44	12	0	5	105	19	1	21	159	15	0	4
45	14	0	24	106	19	3	14	160	14	1	18
47	15	2	22	107	17	3	18	161	15	0	26
49	13	1	26	108	13	3	2	162	18	0	0
52	17	0	14	109	15	2	12	163	20	0	0
54	16	0	16	110	14	1	18	164	15	3	16
57	16	1	26	112	19	0	15	166	16	1	1
58	18	3	2	114	16	0	12	167	19	3	4

No.	Weight.			No.	Weight.			No.	Weight.		
	cwt.	qrs.	lbs.		cwt.	qrs.	lbs.		cwt.	qrs.	lbs.
169	17	1	22	191	17	0	18	212	18	0	27
170	17	3	0	192	15	2	10	214	15	2	24
171	15	0	7	193	17	0	12	215	21	3	14
173	14	1	17	194	20	0	14	217	18	1	0
174	17	1	4	195	19	1	20	219	17	3	20
175	13	1	25	196	16	1	19	220	15	3	14
176	9	1	26	197	15	0	20	221	16	3	26
177	16	0	3	198	16	3	6	222	18	0	10
178	15	0	20	199	16	2	6	224	18	0	8
179	20	0	23	200	21	0	0	225	23	2	13
180	11	2	11	201	15	0	2	226	17	3	22
181	15	3	10	202	17	3	0	227	16	3	3
182	18	3	15	203	21	3	17	228	19	1	0
183	19	1	6	205	16	3	5	229	19	1	4
184	21	0	23	206	19	3	17	230	18	2	20
186	18	2	2	207	18	0	18	232	13	0	0
188	18	2	5	208	24	3	6	233	22	1	8
189	18	0	24	211	13	0	15	236	14	0	8

SHEEP.

237	6	0	10	276	6	0	20	319	2	1	27
239	5	3	20	277	6	0	8	320	2	1	9
240	6	1	9	279	5	1	16	321	2	2	1
241	5	2	4	280	6	1	15	322	1	2	24
242	4	3	18	282	5	0	12	323	1	3	26
243	5	2	3	283	4	3	27	324	1	3	15
244	5	2	12	284	4	2	16	325	2	0	15
245	6	1	13	285	4	2	22	326	1	3	21
246	6	0	11	286	5	0	0	327	2	0	0
247	6	2	21	287	5	0	2	328	2	1	11
248	7	2	21	288	5	0	5	329	2	0	15
249	7	2	19	290	5	1	22	330	1	3	18
251	7	3	1	292	6	3	9	331	1	3	13
252	8	1	4	293	6	0	27	332	5	3	10
253	7	1	16	294	5	3	23	333	6	3	5
254	7	0	17	295	6	1	13	334	6	3	19
255	9	1	2	296	6	3	6	336	5	3	22
256	6	2	6	297	6	2	14	337	6	1	9
257	6	2	27	298	5	1	23	338	5	2	15
258	7	0	2	299	4	3	22	340	6	1	10
260	7	0	23	300	5	3	1	341	7	0	17
261	6	2	27	301	5	1	18	342	6	1	3
262	5	2	8	303	5	1	9	343	9	1	25
263	2	0	11	304	7	0	23	344	6	1	26
264	1	3	24	305	6	3	24	345	6	1	12
265	2	1	0	306	6	3	5	346	7	1	13
266	2	2	8	307	6	1	4	347	7	0	17
267	2	1	8	308	6	3	27	348	7	1	20
268	2	0	15	309	7	0	2	349	7	3	9
269	3	1	9	312	6	0	4	350	6	0	18
270	5	2	8	313	6	3	22	351	6	2	13
271	5	2	4	314	7	0	11	352	3	3	15
272	5	3	0	315	6	3	4	354	6	1	25
273	5	3	14	316	7	0	8	355	4	3	4
274	6	0	20	317	2	0	0	356	5	3	22
275	6	1	2	318	1	3	1	357	5	1	16

No.	Weight.			No.	Weight.			No.	Weight.		
	cwt.	qrs.	lbs.		cwt.	qrs.	lbs.		cwt.	qrs.	lbs.
358	5	2	3	366	7	0	25	377	1	3	1
359	4	2	13	367	6	1	7	379	2	0	20
360	5	1	1	370	2	0	14	380	1	3	1
361	4	2	16	371	1	3	14	381	2	0	16
362	5	3	18	372	1	2	8	382	2	3	13
363	5	1	20	373	2	1	27	383	2	0	20
364	6	0	12	374	2	0	21	384	2	1	0
365	6	3	16	375	1	3	6	384A	2	1	7

ARMY APPOINTMENTS.

War Office; *December 22nd.*

19th Hussars.—Veterinary Surgeon James Kettle, from the Royal Artillery, to be Veterinary Surgeon, *vice* Barrow, deceased.

OBITUARY.

We have to record the death of Mr. Charles Pilgrim, M.R.C.V.S., Brooklyn, New York, in the 49th year of his age. Mr. Pilgrim's diploma bears date July 5th, 1843.

Death of Professor Defays.—The death is announced in the *Annales de Médecine Vétérinaire,* of Brussels, of F. J. Defays, Professor of Clinic at the Belgian Royal Veterinary School, and Member of the Royal Academy of Medicine of Belgium, of the Royal Medical and Natural Sciences Society of Brussels, and other learned bodies. The professional career of M. Defays was highly distinguished, and as a citizen he appears to have been held in the highest esteem for his devotion to the solution of important public questions, and the benefits he conferred on the community of his native town; but his services to medical science, human and comparative, will always obtain for his memory the highest degree of respect. He was one of the founders and editors of the *Art Médical,* a monthly medical journal, to which he contributed valuable and interesting communications for nearly every number; he was also a co-editor of and contributor to the *Annales Belge de Médecine Vétérinaire,* and he assisted in drawing up the annual report of the Agricultural Commission, of which he was a member, and for which he every year, since 1864, furnished a *résumé* of the quarterly reports of the Government Veterinary Surgeons. He was the inventor of several ingenious instruments and mechanical appliances, especially those for the correction of deformed or defective limbs and feet. A description of the latter he published in a little work on "Pathological Farriery." He rendered most important services to his country during the prevalence of the cattle plague, from 1865 to 1867, and largely contributed to the extinction of that

scourge in Belgium. For these services he was decorated with the Civic Order of Leopold. M. Defays was born on March 11, 1819, and after having been educated at the University of Liège, where it was intended he should graduate in medicine, he entered the Veterinary School at Cureghein in 1843, and passing an examination with the greatest distinction, he obtained his diploma in 1847. He was son-in-law to the late Professor Verheyen.

Professor Spooner.

The painful duty of having to record the death of Professor Spooner came upon us so unexpectedly that in our last number we could do little more than announce the melancholy fact. His departure was like a deep dark-cloud rapidly overshadowing the zenith, not, however, to be as quickly dispersed, but to leave its gloomy shadows long lingering on the horizon. His body now rests in the tomb, but his name and memory will live while a history of veterinary medicine remains to be written. For many a year he occupied a post the most distinguished in the profession, and the highest which those in power have to bestow. He is now no more.

Charles Spooner was the youngest son of the late Mr. Spooner, of Fordham, Essex. At the time of his birth his father occupied the Dairy Farm in Mistley Park, near Manningtree, whither he had removed from Yorkshire. He was born Oct. 19, 1806, so that he had just entered on the sixty-sixth year of his age when death removed him from amongst us. On the completion of his scholastic education he was apprenticed to a chemist—the late Mr. George Jervis, of Westbar, Sheffield—and shortly after completing his time, viz. in 1828, he elected to become a veterinary surgeon, and entered as a pupil at the Royal Veterinary College. During the following year he passed the examination test, then conducted by a board of examiners presided over by the late Sir Astley Cooper. While at college the writer of this obituary made his acquaintance, and a friendship was begun between them which lasted down to the day of his death—for the long period of forty-three years. Very shortly after obtaining his diploma Charles Spooner was appointed Veterinary Surgeon to the Zoological Society, mainly through the influence of the late Professor Sewell, who never ceased to feel a deep interest in his young friend's welfare. This appointment gave him the opportunity of extending his anatomical and pathological knowledge; and foreseeing that much more must be done for the pupils at the College, especially in practical anatomy, he took a house nearly opposite the institution and established a school of anatomy. This proved a success, and by far the larger number of the College pupils entered the classes at Charles Spooner's. He did not, however, long hold the appointment to the Zoological Society, having been succeeded by the late Mr. Youatt.

We now find him more earnestly engaged in the work of the profession, and conjointly with his friend the late Professor Morton, giving lectures outside the college walls. Thus he worked on to the

summer of 1839, when, by the unexpected retirement of the late Mr. Vines from the demonstratorship of the College, he accepted the vacant office at the solicitation of the late Professor Coleman, and by the advice of his best friends, who had long desired to see him inside the institution. The death of Professor Coleman in the following month, and the consequent elevation of Professor Sewell, led to his appointment as assistant-professor—the post of demonstrator being filled up by the appointment of the late Mr. William Barth, E.I.C. In 1842 another elevation awaited him, and he became Deputy Professor on the appointment of a Lecturer on cattle pathology, and Assistant Professor to the College. This office he held up to 1853, when by the death of Professor Sewell, he became Principal of the College. It will thus be seen that for a period of eighteen years he stood at the head of the profession.

During this time important changes have taken place, with all of which Professor Spooner has been necessarily more or less associated. Not the least of these was the obtainment of the Charter of Incorporation in 1844, when among other things the power of passing members into the profession by a board of medical examiners, assisted by the two highest office-bearers of the College, ceased, and the appointment of a new board was vested in the Council of the corporate body. After this Professor Spooner became an examiner *ex-officio*, and was in addition elected a member of the Council. His original election was periodically confirmed at the annual meetings of the profession, so that he continued in office to the end of his days. In 1858 he was also chosen President of the College, an office which he filled with his usual tact and ability.

As a lecturer he occupied the highest place. In the profession it cannot be said that one better could be found, and out of it but few who could more readily or fluently express themselves. The present generation of veterinary surgeons has in a great measure been reared under his auspices, and is ready to bear witness to his talents and his powers. It is much to be regretted that he did not employ these more extensively in the use of his pen; for then it might have been said of him, "that being dead he yet speaketh," and the experience he had gained and his tutorial instruction would not have been lost to posterity, but the profession would have looked back from a far-distant date with pleasure and advantage to the career of Professor Charles Spooner.

ERRATUM.

At page 879, vol. xliv, in note, *instead* of "Apulius," *read* "Apuleius."

THE

VETERINARIAN.

VOL. XLV. No. 530. FEBRUARY, 1872. Fourth Series. No. 206.

Communications and Cases.

OBSERVATIONS ON THE ANATOMY AND PHYSIOLOGY OF THE HORSE'S FOOT.

By George Fleming, M.R.C.V.S., Royal Engineers.

Physiology of the Horse's Foot.

(*Continued from* p. 8.)

The influence of food on the growth of horn is also demonstrated to a certain extent by turning horses out to graze in the early part of the year. With them, in a few months, we also find the hoof marked by a prominent ring towards the coronet as the effect of increased secretion, due to the change of nourishment. But the effects of different kinds of aliment on the increase and quality of the horn is a subject that has scarcely yet received the attention it deserves, if we consider its interest and importance.*

* The influence of food on the growth of horns and tusks has been hinted at by a celebrated explorer, in a work on Ceylon; and as his remarks are of interest in connection with the above observations, I will quote them here. "Nothing produces either ivory or horn in fine specimens in Ceylon. Although some buffaloes have tolerably fine heads, they will not bear a comparison with those of other countries. The horns of the native cattle are not above four inches in length. The elk and the spotted deer's antlers are small compared with deer of their size on the Continent of India. This is the more singular, as it is evident from the geological formation that at some remote period Ceylon was not an island, but formed a portion of the mainland, from which it is now only separated by a shallow and rocky channel of some few miles. In India the bull elephants have tusks, and the cattle and buffaloes have very large horns. My opinion is that there are elements wanting in the Ceylon pasturage (which is generally poor) for the formation of both horn and ivory."—Baker, 'Eight Years' Wanderings in Ceylon,' p. 151.

In harmony with the greater activity of the functions of the skin in horses at the advent of spring,—when the thick, long, woolly coat of winter disappears and is succeeded by the fine silky robe of summer,—the Keratogenous apparatus also evinces the influence of an exaggerated stimulus in its secreting an increased quantity of corneous material, which, as usual, forms a salient ridge around the upper border of the wall. This ridge on the hoof corresponds to the ring developed at the same period at the root of the frontal horn in the bovine species.

Age, as might be supposed, also produces its effects on the growth and quality of the hoof. In the young horse, we generally find that it increases more rapidly, and the texture is of better quality, than in many old animals, whose hoofs very frequently grow slowly, and are thin, brittle, and shelly.

Rest and exercise have also been noted as favorable or otherwise to the generation of horn, and it may be readily conceived *a priori*, that movement and the percussion of the feet on the ground will, by quickening the circulation in these organs, tend to produce a more rapid supply of that substance. Observation has demonstrated that among army troop-horses the hoofs grow faster during the season of manœuvres, or while on the march, than when they have longer periods of rest in stables. This is indubitably shown by the difference in the length of time which the letters and figures burnt on each front hoof at its upper part take to reach its lower margin. In daily practice, apart from army experience, the same fact may be noted. If, for example, we take two horses of the same breed, age, colour, and size, and whose hoofs in the same conditions have an equal rate of growth, and subject one to regular work for a month, while the other remains idle, at the end of this period it will be necessary to remove more horn from the first than the second, in order to restore their feet to their proper length and position. As has been mentioned, the hoof grows faster when the horse is at liberty and unshod than when it is shod; the continual wear of the horn against the ground stimulates its reproduction; the destructive agent is at the same time the natural and energetic force at work in exciting growth, for in giving the shock that destroys it exalts the power that creates, enabling nature to maintain the equilibrium between reparation and deperdition. But whether the foot be shod or unshod, it is none the less true that exercise hastens the development of its protecting case; though here again we have other influences intervening which modify, or even negative, the statement. One of these

is the amount of exercise, another is the nature of the ground over which the animals travel. It would appear, for example, that growth is more favorable on sandy than on argillaceous soils; on turf than on artificial roads; and with horses that perform a moderate amount of work than those that are overworked. In the first instance, the circulation in the generating tissue may be rendered more active from the greater salutary reaction of the ground; while in the second this reaction may become too intense, and what was genial pressure on the turf, becomes on paved roads severe concussion, which disorders the circulation, induces more or less congestion of the secreting surface, and consequently a diminution in the supply of horn. Over-exertion brings about the same condition—congestion of the generating tissue and modified secretion.

The influence of general diseases has not been closely observed, though it might be surmised that those morbid conditions which influence the epidermic and pilose growths would also produce analogous effects on the formation of the hoof. The relations between certain forms of derangement of the digestive organs and laminitis, with its hoof alterations, may be cited as a good illustration.

It has been stated that growth is more rapid in warm than in cold countries, and in summer than in winter: the elevation of temperature and increase of vital energy accelerating it; while repair being proportionate to wear, the latter is greater on the hard dry soil of a hot climate than on the soft damp ground of a cold one. The balance between wear and repair is also exemplified in the case of a vigorous well-fed horse, and one that is ill-fed and feeble; in the first the hoofs grow strong and quickly, for to it exercise is absolutely necessary, but the other has less desire for movement, and therefore does not destroy so much horn.

The part that nervous influence plays in determining the growth of the hoof has not yet, perhaps, been fully investigated, but that it has some power in the horn-forming process there cannot be a doubt. From personal observation I can testify that after the operation of neurotomy the growth of the hoof is increased, and that horses which, previous to the operation, had a somewhat feeble secretion of horn, and that not of the best quality, soon afterwards had larger and stronger hoofs. A horse of my own, with narrow feet and weak brittle hoof-walls, was operated upon in 1865 at Aldershot, having become affected with naviculararthritis in one foot through an accident. In 1866 the hoof of this foot,

though there had been no difference in the management of it, was much improved, and the farrier constantly remarked, that whereas before the operation the wall scarcely required any shortening, now he had to use his rasp rather freely. In 1870, when I sold this animal, there was no lameness, the hoof was good, and the growth comparatively rapid and regular. So much for clinical obervation.

So long ago as 1857 Dr. Brauell,* professor at the Dorpat Veterinary School, reported some experiments conducted by Herr Grohn, which had for their object the solution of the problem as to whether the nerves had any particular influence on the growth of the hoof, and as the results arrived at are valuable from the conclusions to be derived from them, we shall notice them here.

The horses experimented upon were nearly all destined for dissection, and they had healthy hoofs; in the second experiment the horse had been at grass for some time, and was afterwards placed in a stable like the others. All the horses were submitted to the same *régime*, the quantity of food allowed was the same, and they all had the same attention paid them.

The fore feet were pared as for shoeing, but they were not shod.

An arc of a circle was traced on the wall of each foot, at about an inch from the lower border, so that if the hoof became broken the experiment would not be modified or interrupted. The very lowest part of the foot was not, therefore, included, in the investigation.

The arc was divided into millimètres, and various heights were measured from it up to the coronet, these different points were marked by small notches. These measurements were taken on the anterior part, and also at an equal distance on the outer and inner sides; the heights were indicated by notches to prevent mistakes. When this had been done on both fore feet, neurotomy (high operation) was performed on the limbs, and a section of each plantar nerve, one millimètre in length, excised.

The animals were kept for some time, and the measurements were taken in the same manner at regular periods, and carefully noted. The wounds due to the operation were left to themselves after they had been closed by sutures.

First Experiment.—A bay-brown gelding, five years old, neurotomised in the left fore leg on the 11th of February, 1852. The sensation was markedly destroyed from the

* 'Magazin für die gesammte Thierheilkunde,' Jahrg., 20, p. 389.

lower extremity of the limb to the part where the operation had been performed. The animal died in about three weeks

The following were the results of the measurements:

Parts of the Hoof.	Before the Operation.		20 Days after Operation.	
	Healthy Foot.	Neurotomised Foot.	Healthy Foot.	Neurotomised Foot.
	Millimètres.	Millimètres.	Millimètres.	Millimètres.
Anterior part	68	71	70½	74¼
External part	45	46	48	50½
Internal part	44	47	47	51

The amount of growth after twenty days was therefore for the

	Healthy Foot.	Neurotomised Foot.
	Millimètres.	Millimètres.
Anterior part	2½	3¼
External part	3	4½
Internal part	3	4

Second Experiment.—Bay-brown gelding, twenty years old, neurotomised on the 3rd of March, 1852, in the left fore leg. The loss of sensibility in the lower part of the limb was complete until the animal died. This horse was kept in the stable from the 3rd of March until the 4th of June, that is ninety-two days, and during the whole of that period the measurements were regularly taken every eight days. After the 4th of June it was turned out to graze, and in fourteen days it was brought again into the stable. On its return the neurotomised limb was found to be colder from the knee downwards than the other, and œdematous. Soon after the animal chanced to slip, and this leg was so displaced that the hairs of the fetlock nearly touched the ground. On the hundred and thirty-second day after the operation gangrene of the foot was observed, and the horse died on the following day. The neurotomised portion was composed mainly of cicatricial tissue, and did not contain any primitive tubes.

The results of the measurements were as follows:

Parts of the Hoof.	Healthy Foot.				Neurotomised Foot.			
	3rd March.	25th March.	22nd April.	3rd June.	3rd March.	25th March.	22nd April.	3rd June.
Anterior part .	72½	76½	82	87½	69½	75	82¾	91
External part .	42½	46½	53¾	60	47	51½	59½	66¾
Internal part .	54	57½	63¼	70½	52	57½	67½	76½

The amount of growth was therefore:

Parts of the Hoof.	Healthy Foot.				Neurotomised Foot.			
	3rd Mar. to 25th March.	25th March to 22nd Ap.	22nd Ap. to 3rd June.	Total.	3rd Mar. to 25th March.	25th March to 22nd Ap.	22nd Ap. to 3rd June.	Total.
Anterior part .	4	5½	5½	15	5½	7¾	8¼	21½
External part .	4	7¼	6¼	17½	4½	8	7¼	19¾
Internal part .	3½	5¾	7¼	16½	5½	10	9	24½
	Total			49	Total			64¾

Third Experiment.—A horse twenty years old, neurotomised on the 26th March, 1852, in the left fore leg. Sensation continued in the limb the whole time, although the low operation was also performed. The animal died thirty-three days after the operation. On examination of the limb some small nervous fibres were found passing to the foot from the trunk of the nerve above the sections. Only two measurements were taken at the anterior part of the hoof,—one before the operation, the other soon after death.

Part of the Hoof.	Before the Operation.		After Death.	
	Healthy Foot.	Neurotomised Foot.	Healthy Foot.	Neurotomised Foot.
Anterior part	52	47½	58	56
Growth	...	...	6	8½

(*To be concluded in our next.*)

DISEASE OF THE GENERATIVE AND URINARY ORGANS IN A STIRK.

By J. W. Hill, M.R.C.V.S., Wolverhampton.

I have sent per train this afternoon the uterus and kidneys of a stirk, which I made a *post-mortem* examination of this morning, December 19th; the disease appears to be of a cancerous nature. My attention was first directed to the case on Sunday morning, December 17th, during a visit to see a sick horse. I was then asked to look at the stirk, which was said to be endeavouring to cast her calf. When I saw her she was lying down and grunting, pulse low, extremities cold; there was also excessive tympany present. With difficulty we got the animal up. I learnt that the stirk had not passed any feculent matter since the previous day (with the exception of a small quantity, very dry and hard); which fact, added to the signs of an accumulation of gas in the rumen, in association with frequent grunting, inclined me to think that there was impactment of the third stomach. As there were no symptoms of straining nor any appearance about the generative organs externally to lead one to the supposition that abortion was taking place, I administered an aperient in the shape of a physic ball dissolved in warm water and mixed with three pounds of treacle, not being prepared for such a case, and having no better medicine with me. A dose of Ol. Lini had been given before I saw the animal. Instructions were left for a messenger to come up to me in the evening at five o'clock if no movement of the bowels had taken place; but at that hour the bowels acted; the animal was, however, by no means relaxed. A saline purgative was administered the following morning. Upon attending again on Tuesday, I found the animal dead, death having taken place early that morning. A *post-mortem* examination revealed the following lesions: abdominal cavity full of blood-coloured fluid, the uterus, together with the kidneys and adjacent parts, were one mass of disease, having, in fact, gone on to gangrene, the kidneys excepted. These were in a highly inflammatory condition and surrounded with watery fluid; the whole mass was insufferable, and emitted a most offensive stench, but no fœtus was present. There was a large abscess in connection with the uterus from which a quantity of fœtid pus escaped, and the walls of that organ, as you will perceive, were considerably thickened and diseased,

the lining membrane being almost black; in fact, much of the structure was so rotten that it could only be removed piecemeal; the other organs were apparently healthy. I was told by the owner upon first seeing the stirk that she had been to the bull several times last summer, but that copulation always appeared to give her great pain, and I have no doubt from that information and the present condition of the parts that the disease had existed some considerable time.

AMPUTATION OF THE UTERUS OF A BITCH.

By Harry Olver, M.R.C.V.S., Tamworth, Staffordshire.

On looking over some back numbers of the *Veterinarian*, I found in the September number for 1871 a description of a "Case of Amputation of the Uterus of a Ewe, by Mr. H. Barnes, M.R.C.V.S., of Malpas;" this leads me to allude to a somewhat similar case which came under my notice about two months since.

Being on business at Burton-on-Trent, I called on a professional friend, who requested me to look at a very valuable bitch (used as a "night dog") which had just been placed under his care with an inverted uterus. The uterus it was stated had been inverted for some hours, and my friend had tried every possible means to return it, but from its congested and enlarged condition this evidently was impracticable, so we decided to amputate it.

We at first tied a ligature very tightly around the viscus, almost close to the vulva, to prevent hæmorrhage, then excised the protrusion with a sharp knife, which occasioned very little bleeding. Subsequently we returned the remaining portion of the organ, and gave the patient a stimulant. The after treatment consisted of light but nutritious food, with occasional doses of port wine and Tinct. Aconite.

The bitch I am told soon recovered, and has since been doing her regular work without any apparent inconvenience.

UMBILICAL HERNIA, TERMINATING IN RUPTURE OF INTESTINE.

By S. Lomas, M.R.C.V.S., Winslow, Cheshire.

On Monday, December 11th, I was called upon to attend a thoroughbred filly, the property of Mr. A—. On my arrival I found the case to be one of umbilical hernia, accompanied with a considerable amount of effusion into the subcutaneous areolar tissue, more especially in front of umbilicus. The tumour was firm, hard, and hot, and the animal somewat distressed. The history of the case was as follows: the filly had been affected with umbilical hernia from her birth, but the protrusion was not larger than a hen's egg previous to Saturday, December 9th, on which day the groom found the filly down in her box with her legs towards the "boskin," and her back towards the centre of the box, a position against which she had to struggle hard to regain her feet. However, he took little notice of her at the time, but on the following day he observed that the navel was more swollen than usual, and that the swelling was extending along the under part of the belly to a considerable distance. After a careful manipulation of the hernia, which failed to satisfy me that it was strangulated, I carefully scarified the swollen parts in front of the umbilicus, and ordered fomentations to be steadily applied. During the next five days the effusion gradually decreased and had nearly disappeared by the 19th, but the discharge which came from these incisions was now found to be fœtid. As the hernia was still large and hard, a compress was applied on the 20th and kept on until the 22nd, when on removing it I observed that there was more fœtor than usual, and that the pad was stained with feculent mater. On making a careful examination, I found a solution of continuity in the parts beneath the skin—a sac in fact—anteriorly placed to the umbilicus. The contents of this sac were pressed out and found to consist of alimentary matters, such as half-masticated hay, oats, and bran, mingled with some feculent fluid which was very fetid. On exploring the interior of the cavity I found a sinus leading upwards and backwards to the hernia proper, but with the exception of this passage, the hernia and sac were separated by what appeared to be a fibrinous deposit. Besides the local symptoms just described, the constitutional disturbance was such as to forbid any hope of the animal's recovery, and from this time she slowly

but gradually grew worse; the discharge of alimentary matters from the opening increased daily, and the effusion into the areolar tissue became diffused on all sides of the hernial sac. The animal died on the 27th. Unfortunately I was prevented making a *post-mortem* examination, so as to speak of the general condition of the intestines, but this can be easily understood.

I give the above case not because umbilical hernia is unfrequent, but on account of its leading to rupture of intestine—a termination which I believe to be exceedingly rare. The length of time the animal lived after the rupture had taken place, viz. from December 11th to December 27th, is also worthy of note.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from* p. 14.)

The next group which we have to review forms so natural an assemblage of plants that we deem Professor Lindley to be right in separating them under the term—

Gymnogens.

Of this class the learned Professor gives the following description: "The plants comprehended in this class have nearly an equal relation to flowering and flowerless plants. With the former they agree in habit in the presence of sexes, and in their vascular tissue being complete; with Ferns and Club-mosses among the latter; some also accord in habit, in the peculiar gyrate venation of the leaves of some Cycadæ, in their spiral vessels being imperfectly formed, and in the sexes being less complete than in other flowering plants; the females wanting a pericarpial covering, and receiving fertilisation directly through the foramen of the ovule, without the intervention of style or stigma, and the males sometimes consisting of leaves imperfectly contracted, an anther bearing a number of pollen-cases upon their surface. So great is the resemblance between Club-mosses and certain Conifers, that I know of no obvious external character except size by which they can be distinguished. Gymnogens are known from most other Vasculares by the vessels of their wood having large apparent perforations or discs. It is not, however, on

this account to be understood that they differ in growth from other Exogens; on the contrary, they are essentially the same, deviating in no respect from the plan on which Exogenous plants increase, but having a kind of tissue peculiar to themselves.—'Vegetable Kingdom,' p. 221. *The naked seeds* then upon which the class is founded is the grand distinctive element, but no less so is the general style of the typical orders of which the class is formed.

The Orders of Gymnogens.

CYCADACEÆ—Stem simple, continuous; leaves, parallel-veined, pinnate; scales of the cone, antheriferous.

PINACEÆ—Stem repeatedly branched, continuous; leaves simple, acerose; females in cones.

TAXACEA—Stem repeatedly branched, continuous; leaves, simple, often fork-veined; females solitary.

GNETACEÆ—Stem repeatedly branched; continuous; leaves simple, net veined.

Two of these orders we shall now especially refer to, namely, the Pines and Yews, which, though having so much in common in their arborescent growth, are yet well distinguished by their fruits.

The *Pinaceæ* include some of the grandest trees in the world, on which account great attention has been paid to their cultivation, and "*Pinetums*," or plantations especially devoted to collections of the Pine or Fir tribes, are not at all uncommon.

We have, however, a very small native list connected with the class, and the order Pinaceæ is indeed represented by only two species, the *Pinus sylvestris*, commonly known as the Scotch fir, and a representative of a second section in the *Juniperis communis*, the common Juniper shrub of some of our dry calcareous hills.

We have for years commonly grown for residential purposes, as well as for profit, the Norway spruce, the larch, and the cedar of Lebanon, and more recently spruce, pines, and deodars of endless species and varieties.

Both the Scotch and Norway firs grow sporadically, that is, increase naturally from seed, as has been noted by Sir W. Hooker in Scotland, where, speaking of the first, "it constitutes vast natural forests;" and Dr. Blomfield remarks that "*P. sylvestris* and *P. pinaster*, though not aborigines, are becoming established by spontaneous dissemination over the vast moorlands and bog tracts of West Hants and Dorset, which they seem disposed to convert into pine woods similar to those in the Highlands of Scotland, the Landes of Bordeaux, or the pine barrens of North America."

In our botanising expeditions on the Cotteswold Hills, we became aware of the same fact, though this district is just the reverse of moorland, being dry elevated tracts on the stone-brashes of the inferior and great oolites. The young seedlings of firs are especially noticeable in the fine domain belonging to Earl Bathurst, called Oakley Park, and more especially in that part towards the noble avenues known as the "cathedral firs," so named from the magnificent nave and transepts presented by the conically planted series of *Pinus-Abies-excelsa.* Bentham, speaking of the pines, says:—

"The cultivated species of this genus are very numerous, belonging to the four principal sections considered by some as genera, namely:

"1st. The true pines with subulate evergreen leaves in clusters of from two to five, and hard cones with scales usually thickened at the top, including besides the Scotch pine the *Pinaster* or *Maritime pine,* the *Weymouth pine,* the *Roman pine,* &c.

"2nd. The spruce firs with shorter, somewhat flattened leaves arrayed singly and often in two opposite ranks, and with thin scales to the cones, including the common or *Norway spruce,* now almost naturalised in Britain, the *Silver spruce,* the *Hemlock spruce,* the *Balm of Gilead fir,* the *Douglas pine,* &c.

"3rd. The larch, with short fine *deciduous* leaves in dense clusters and small cones with their scales, and—

"4th. *The Cedar of Lebanon and Deodora,* with short evergreen subulate leaves, clustered as in the larches and large hard closely packed cones."—'Handbook of the British Flora,' p. 482.

The products of the pines are numerous and valuable, to say nothing of the various species as timber trees; the whole tribe yield very important products, amongst which may be reckoned turpentine, resin, pitch, tar, all of which are well known not only in the arts but as medicines of repute.

Turpentine is much relied upon in both schools of medicine, both for external and internal use, and in good hands there can be little doubt of its great value externally as a stimulant and rubefacient, and internally as a stimulant and diuretic. Pereira says thus: "on both vertebrated and invertebrated animals it operates as a poison. Injected into the veins of dogs and horses it excites pneumonia. Two drachms thrown into the veins of a horse caused trembling, reeling, falling, inclination to pass urine and stools, and frequent micturition. Inflammatory fever with cough continued to the eighth day,

then putrid fever appeared. On the ninth day death took place. Schubarth found that two drachms of the rectified oil given to a dog caused tetanus, failure of the pulse and breathing, and death in three minutes." He goes on to say that "the skin of the horse is very sensible to the influence of oil of turpentine, which produces acute pain. This oil is used by veterinarians as a blister, but it must be employed with caution, as it is apt to remove the hair." Youatt, in his book 'The Horse,' recommends this agent as an antispasmodic in cases of colic in horses.

Country people have great faith in turpentine in cases of falls and bruises, concluding with a Dorset man whom I talked with after a fall from a horse, that "spirits of turpentine was the best thing for bruises, as it found its way into every bwon of the body." Turpentine is used as an anthelmintic both internally and as an enema according to the species of the parasite. Tars and resins from the pines are used for a variety of purposes principally in the dispensary as an adjunct in ointments.

The country farrier was formerly very fond of the use of tar beaten up with garlic in cases of cough in horses, for which most country druggists have a favourite receipt; or if not, most knowing carters have a *resait* for tar balls; but we imagine that in the present day little reliance is placed upon such remedies, the chief recommendation of which seemed to be their powerful odour.

We shall describe the Juniper and Yew in our next. Meanwhile, we shall be greatly obliged for any information which may be forwarded upon the following subjects connected with those plants, namely:

1st. The action of *Juniperus sabina*, Savine, on horses and cattle.

2nd. Cases of poisoning of horses and cattle from yew, and the *modus operandi* of the plant, and especially the reasons why the dried plant should act more powerfully than the green tops.

THE "MAD ITCH" OF CATTLE IN SOME OF THE STATES OF AMERICA.

A CORRESPONDENT—"V. S."—resident at Galena, Illinois, U. S., who possesses the certificate of the Highland and Agricultural Society, writing on matters unconnected with veterinary pathology, says—

There are several diseases in this part of the world which are very interesting to study, and I cannot help thinking that an account of some of them might be interesting to the readers of the *Veterinarian* at home. As yet, however, I have not had sufficient opportunity of thoroughly mastering them, and the authorities here on veterinary matters being almost exclusively M.D.'s, their descriptions of the nature of disease are more calculated to mislead than to instruct. There is one disease, in particular, in cattle which causes serious losses to agriculturists of which I should like your opinion if I am not asking too much. The affection is known as "*mad itch*," and by the authorities before alluded to it is said to be closely allied to typhus. It occurs only in the fall of the year, when the farmers commence cutting the Indian corn. The common practice is to go through the corn as it stands in the field and husk it, leaving the small ears on the stalk. The cattle are then either turned into the field or the stalks are cut and hauled into the pasture, when both cattle and hogs are allowed to feed on them. Now it generally happens that at this season of the year the pastures are very bare, and, consequently, the animals feed greedily, and live exclusively on this kind of fodder. In about eight or ten days from this time the disease makes its appearance.

The first indication of any disturbance to health is diarrhœa, accompanied with symptoms common to derangement of the digestive organs, but as these are generally not of a serious kind, they often pass almost unheeded. The next symptom which is observed is, that the beast commences to violently rub its head or sides of the face against any convenient thing for the purpose. This peculiar irritation about the head is associated with more or less cerebral disturbance. It has singularly happened that in the cases which have come under my notice this irritation was almost entirely confined to the left side of the face and the under jaw. The rubbing of the part increases to such an extent that the face is soon denuded not only of hair but of large patches of skin, and the head becomes a shapeless mass. At no period of the disease, however, is the animal delirious. As might be expected, spasmodic twitchings of the muscles, principally of the head and neck, are associated with this state of things. These with other concomitant symptoms increase until the animal becomes worn out, and dies, not unfrequently in from twenty-four to forty-eight hours.

As yet I have only had an opportunity of making one *post-mortem* examination, and in this case the carcase had been greatly torn and partly devoured by hogs. I found the first

and second stomachs but little affected; the third, however, was much inflamed and presented appearances akin to those of "*fardel bound.*" The fourth stomach and the whole of the intestines were extensively inflamed. They contained few or no fæces, as we might have expected from the state of the bowels from the outset of the disease. My observations have also been limited to one outbreak only, on a farm some distance from here in Wisconsin. At the time I was consulted, out of a herd of about twenty animals, nine had died. I suggested that the still unaffected animals should be removed to a very bare pasture and fed sparingly on light, easily digestible food. I also gave them a smart dose of cathartic medicine. Only one other animal was lost.

There are various opinions among the farmers as to the cause of the disease. Some hold that it is owing to the cattle feeding with the hogs, and thus taking into their stomachs portions of the fodder with the saliva of these animals mixed with it.

I am aware that I have given you a very imperfect description of the disease, but probably you are already familiar with it, and if so, your opinion of its nature would be of value.

[As several veterinary surgeons with whom we are acquainted have had opportunities of studying the diseases of cattle in America, we are desirous of obtaining further information from some of them before expressing our views of the pathology of the malady alluded to. Many of the affections met with in the western hemisphere are, as might be supposed, in several respects peculiar; and we hope ere long to receive full reports of some of them from members of the profession now practising in the States. Our Journal has a free circulation in that country, so that these reports will be of increased value.]

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of December, 1871, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Sheep-Scab .	...	25	...	...	25	25
„ .	Newcastle.	„	...	30	...	...	30	30
Bremerhafen . .	London .	Foot-and-mouth	14	...	...	...	14	14
Coruna. .	Plymouth.	„	2	...	...	...	2	2
Hamburg .	Grimsby .	Sheep-Scab .	...	2	...	...	2	2
„ .	Hartlepool	„	...	1	...	...	1	1
„ .	Hull . .	„	...	6	...	...	6	6
„ .	London .	Sheep-Pox .	...	1	...	...	1	1
Harlingen .	Hull . .	Sheep-Scab .	...	4	...	...	4	4
Total . .		Foot-and-Mouth	16	...	...	...	16	16
„ . .		Sheep-Pox .	...	1	...	...	1	1
„ . .		Sheep-Scab .	...	68	...	...	68	68
Total . .			16	69	...	...	85	85

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 11th January, 1872."

CATTLE PLAGUE.

In Belgium the repressive measures which have been adopted have had the most satisfactory results; nearly all the centres of infection which at one time were numerous, are extinct. Many of the communes of the arrondissement of Audenarde, where the plague recently broke out, and spread with considerable rapidity, have been relieved from the restrictions which were rendered necessary by the advance of the disease. But, as might have been anticipated, fresh outbreaks have occurred in new places. For example, on an isolated farm at Blancourt, in the canton of Florenville, where two beasts have been destroyed. Cattle plague has also invaded West Flanders, which for some weeks remained free, and we learn from the *Journal de la Société Agricole de Brabant* that seven beasts have been destroyed at Monseron, two at Elverdinghe, and four in the canton of Thielt.

There are loud complaints in Belgium respecting the feeble measures which are taken in France to eradicate the disease, particularly in the *département du Nord.*

From the tone of the information on which we based our last report it was not unreasonable to presume that the unfortunate system of experimental treatment with which the French *savans* have been amusing themselves had given place to an energetic onslaught, in which the pole-axe would take the place of all milder remedies. It seems, however, that the stamping-out system is not carried out with the requisite determination to secure its success. The disease continues to spread, and between the first and tenth of January, according to the published returns, there were fifteen departments, including ninety-four communes, in which it was raging. If appearances may be trusted France has yet much to suffer before cattle plague will be entirely extirpated.

Cattle plague exists also in several districts of Gallicia, and in Lower Austria, in the districts of Sechshaus and Mistlebach.

PLEURO-PNEUMONIA.

This disease maintains its normal rate of prevalence as far as can be ascertained, but owners of diseased cattle, particularly in town districts, are not inclined to give information which would subject them to inconvenient restrictions, and therefore the returns of the number of cases in any part of

the country must be taken to represent only a certain proportion of those which actually exist.

According to the last returns pleuro-pneumonia prevails in forty-two counties. During the week ending December 30th over eighty animals were attacked.

FOOT-AND-MOUTH DISEASE.

A FEW weeks ago we were informed that foot-and-mouth disease had suddenly appeared among cattle in the neighbourhood of Hamburg, and the truth of the report was soon evidenced by the landing of considerable numbers of German animals affected with the disease in this country. In some instances only one or two animals of the cargo have been found affected, but in other cases a large proportion of them have been diseased.

There is a steady decrease in the number of attacks in most of the infected districts in this country, but in the Metropolitan Market and lairs numerous cases of the disease have been detected among English cattle, and some among Dutch beasts, which have been turned out from the market to wait for the next market day; there is nothing unusual in this circumstance; indeed, before the outbreak of cattle plague led to public attention being attracted to contagious diseases of animals, the presence of a few hundred cattle affected with foot-and-mouth disease in the market on a Monday morning was too common place an event to excite notice. Under the provisions of the Act the diseased cattle are detained in the market area for slaughter, but those which have been in contact with them are not subject to any restrictions. Up to the present time we have not heard any complaints from breeders and feeders of home stock of the disease being propagated by these means.

Foreign cattle importers protest strongly against the severe restrictions to which cattle and sheep from healthy countries are submitted in the event of foot-and-mouth disease being detected among the animals of a cargo, and contrast the summary course which is adopted in respect of them with the entire freedom which is accorded to English stock under similar circumstances. Several cargoes of animals affected with foot-and-mouth disease have been landed at the New Foreign Market at Deptford, but all possible precautions are taken to prevent any extension of the disease by isolation of diseased animals, and disinfection of lairs and landing places.

Facts and Observations.

The Foreign Cattle Market.—The Lords of the Council have appointed Mr. S. G. Holmans, M.R.C.V.S., Veterinary Inspector at the Foreign Cattle Market. Mr. Holmans had long held the office of Inspector at the Port of London, under the Commissioners of Her Majesty's Customs, and his selection for this important post proves the confidence which the Privy Council places in his professional skill, and its appreciation of the manner he has hitherto performed his duties. The market is gradually assuming importance, through the amount of business transacted there; and an opinion has been expressed by the Chairman of the Markets' Committee, in Common Council assembled, that it promises to be a success. The first lot of animals received at the market consisted of 1082 sheep exported from Antwerp, ex ship "Orion." They were landed on January 6th. Within a day or two afterwards 80 oxen and some more sheep were debarked at the market pier. The market has also been used for the reception of cattle suffering from foot-and-mouth disease—a cargo landed at Brown's Wharf, Poplar, having been transhipped to Deptford, which were found on landing to be suffering from this disease.

Inoculation of Cancer in the Lower Animals.—At the meeting of the British Association in Edinburgh, Dr. John Chiene read a paper entitled "An Experimental Inquiry into some of the Results of Inoculation in the Lower Animals." The paper described a series of experiments, in which rabbits were inoculated with cancerous matter obtained from the human subject. The result may be shortly stated in the following words:—(1) That cancer cannot be produced in rabbits; (2) that cysts, containing cheesy matter, arise at the points of inoculation; (3) that these cysts do not differ from the local appearances which arise after the application of any irritant to the subcutaneous tissue of the rabbit.—*Popular Science Review.*

Preservation and Improvement of Beet-Root Leaves to be Used as Fodder for Cattle.—Dr. Méhay.—The process here described essentially consists in steeping for a few minutes the leaves and heads of the beet-roots in weak hydrochloric acid (4° Baume = 1·027 sp. gr.), leaving the vegetable matter to drain for a moment, after which

it is placed in heaps into a kind of tank-like hole dug into the soil, care being taken to line its bottom and sides with straw. When filled the heap is first lightly covered with straw and then with earth—in fact, arranged in the manner used for preserving potatoes, carrots, &c. From the testimony of competent agriculturists and veterinary surgeons, the process here alluded to is indeed to be recommended for its good effect upon the cattle fed by vegetable matter thus preserved.—*Chemical News.*

A New Theory of Nervous Action.—This theory, which was put forward some time since by Dr. Robert M'Donnel, and escaped our notice, we now call attention to, for it is very remarkable, and worthy of serious consideration. The paper was read before the Royal Irish Academy. The theory is thus stated by the author:—"I conceive that the various peripheral expansions of sensitive nerves take up undulations or vibrations, and convert them into waves capable of being propagated along nervous tissue (neuricity, as it has been named). Thus, the same nerve tubule may be able to transmit along it vibrations differing in character, and hence giving rise to different sensations; and, consequently, the same nerve tubule may, in its normal condition, transmit the wave which produces the idea of simple contact, or that which produces the idea of heat—or, again, the same nerve tubules in the optic nerve which propagate the undulations of red may also propagate, in normal vision, those which excite the idea of yellow or blue, and so for other senses. I advocate this undulatory theory of sensation in preference to the theory of distinct conductors—1st, because it is simple. 2ndly, because it is strongly supported by analogy, when compared with wave propagations in other departments of science. 3rdly, because it appears to be in harmony with a large number of recognised physiological facts, which seem inexplicable upon the theory of distinct conductors."—*Popular Science Review.*

Iron as a Filter and Deodoriser.—Attention has recently been called to the use of spongy iron as a deodorising material, which Dr. Voelcker considers of greater potency than animal charcoal. Sewage water passed through a filter of this substance is completely purified, and this filtered water, after having been kept six months protected from the air, was perfectly sweet, and free from any fungus growth. The spongy iron is obtained by calcining a finely divided iron ore with charcoal. Mr. Spencer, whose name is connected with the discovery of the electrotype, has for some time been advocating the use of a filter of this description. Its power of

rendering water beautifully transparent, and apparently free from all organic matter, is its strong recommendation. We ourselves have had a considerable experience of the Spencer filter, and we consider it an admirable one.—*Ibid.*

Detection of Xanthine in Urinary Calculi.—M. Lebon showed, at a late meeting of the Academy of Sciences of Paris, a calculus which M. Cruveilhier, jun., had asked him to analyse. The outer layer was composed of phosphate of lime mixed with ammoniaco-magnesian phosphates only one thirtieth of an inch thick. The next layer consisted of oxalate of lime, and was as thin as the first, but the bulk of the stone was made up of xanthine, and a small proportion of urate of lime. This nucleus, dissolved in hydrochloric acid, yielded beautiful crystals of hydrochlorate of xanthine in hexagonal lamellæ. The usual mode of detecting xanthine is excellent when the latter is pure; but when it is mixed with lithic acid or lithates, as is often the case, the common method is not satisfactory. M. Lebon has found the following procedure useful for separating lithic acid from the xanthine, being founded upon the solubility of xanthine in hydrochloric acid, and the insolubility of lithic acid, in the same liquid. Let, therefore, a fragment of the stone, reduced to powder, be boiled in hydrochloric acid, and the fluid be filtered. The insoluble portion of the latter is lithic acid, and the substance held in solution is xanthine. The nature of both substances may then be made out very easily by watching their usual reactions.—*Lancet.*

A Source of Albumen.—Albumen is now produced on a large scale at Pesth, Hungary, and in North Germany, from the blood of animals. The serum separating when blood coagulates consists chiefly of albumen. The best quality of albumen thus obtained is transparent and soluble in water, and is used for mordanting yarns and cloth. At Pesth blood is dried in flat iron pans by exposure to air at a temperature at from 100 to 112° F. From 3000 pounds of blood about 110 lbs. of albumen is obtained, at a cost of 29 dols.; 16,200 eggs would yield the same amount of albumen at a cost of 96 dols. Although the cost of egg albumen is three times as great as that of blood albumen, the former is preferred for dyeing purposes, on account of its purity. Blood albumen of a second quality, darker in colour, but nearly all soluble in water, is used largely in the process of refining sugar.

Carbolic Acid in Snake-bite.—Dr. Weir Mitchell, from observations on the bite of the rattlesnake, and MM. Gicquian and Viaud Grand-Marais, from observations on that of the viper, have arrived at the conclusion that the application of carbolic acid immediately on the receipt of the injury prevents both local and general poisoning. The pure acid, however, if applied in too great quantity, is liable to produce sloughing, and even dangerous symptoms: hence it is best used in the proportion of two parts of acid and one of alcohol. Given internally, or applied to the wound at a late period, it produces no effect. It is believed to act, not by neutralising the poison, but by causing contraction of the small vessels, and thus preventing its absorption.—*Journal de Méd. de l'Ouest.*, and *Bull. Génér. de Thér.*

Cholera and Copper.—It is well known that during the epidemics of cholera which have occurred in this country, Birmingham suffered little or nothing in comparison with other large towns. The cause of this immunity from the disease was variously accounted for. One of the most prevalent opinions was, that it was dependent mainly on the extent of the workings in copper carried on in the town and neighbourhood. It would appear from a late publication of Dr. Burg's that there is some ground for believing that that opinion is the correct one. Dr. Burg, in revising the different statistics of deaths from cholera during its last outbreak in Paris in 1864 and 1865, finds that, out of 26,332 artisans in brass and copper, there were only 16 deaths—viz., 6 per 1000. In other statistics he finds, among 5650 coppersmiths, founders of bronze, and manufacturers of brass instruments, not a single death is recorded from cholera. In the Society of the "Bon Accord," formed in Paris in 1819, and composed only of workers in bronze, there has not been a single member attacked by cholera since the foundation of the Society; and we may add to these curious and interesting facts that the city of Mio-Tinto, protected as it is by the surrounding copper mines, has never been visited by the epidemic, although it ravages all the surrounding provinces.—*Med. Times and Gazette.*

THE VETERINARIAN, FEBRUARY 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—Cicero.

PROTECTION AGAINST FOREIGN CATTLE PLAGUES.

Those who are charged with the carrying out of the regulations which are intended to prevent the introduction of infectious diseases from abroad, labour under the serious disadvantage of being exposed to all sorts of misrepresentation without having the opportunity to explain or defend their actions. British farmers read all the reports which from time to time obtain currency respecting the dangers which home stock incur, owing to the exceedingly lax restrictions upon the importation and movement of foreign animals, but they rarely if ever pore over a copy of the 'Gazette' for the purpose of ascertaining what those regulations are of which complaint is made.

A positive though incomplete and altogether garbled account of the treatment to which a certain cargo of foreign cattle had been submitted at once attracts attention; all the possible evils which may arise from letting these prolific centres of infection loose are immediately patent to the reader's mind; every romantic description of the unsanitary state of cattle on the continent is accepted without question; and the final result is the establishment of a conviction that the home producer is hardly dealt with, while every facility is given to the foreigner to introduce, in the name of free trade, destructive diseases into this country. Often we have had to controvert in these pages the reckless statements of individuals who gave forth their crude views based on insufficient knowledge of the circumstances to which they referred. In all charity we have usually given those persons credit for good intentions, but we are rapidly drifting into a state of doubt on this point. During the last year or two so many false alarms have emanated evidently from the same source, that we are almost compelled to suspect the ignorance of the facts to be some-

times not so real as it seems. If it be asked what motive can possibly actuate the uncompromising opponents of the foreign cattle trade the answer is at hand. It is assumed, or rather it is broadly stated by them, that for every foreign animal that is landed in this country two home-bred animals are destroyed by the diseases which are introduced by the imported beasts, and if we do not mistake a high veterinary authority endorses this assumption. Further, it is alleged that to the entire consumption of meat in this country the continent contributes only nine per cent., of which one half is sent as dead meat, thus reducing the proportion of live stock to four and a-half per cent. of the total quantity used for food. We have no idea how the calculation of the consumption of homebred stock is to be proved; but it is quite clear that unless some reliable data on this point can be obtained the stated proportion must be purely hypothetical; one fact in statistics, however, we must refer to, something like forty-five per cent. of the supply of cattle to the London market comes from abroad. To the population of London at least this fact is significant, and in spite of all that has been said to the contrary, we must hesitate to admit that a decrease in the number of imported animals would not seriously affect the consumer. The suggestion that we should be sufficiently supplied with home stock if foreign animals were altogether excluded we scout as absurd, and yet if it is true that we lose two of our own stock for every foreign animal that is introduced here, we ought to have stopped importation long ago.

The opponents of foreign cattle importation contend that all animals landed in this country should be kept in quarantine for the longest period of incubation of the infectious diseases to which they are liable, or failing this, they should be slaughtered at the landing places.

Quarantine is simply impracticable, and, therefore the only tangible question is, shall all imported animals be killed at the place of landing? According to the Privy Council regulations this question is answered in the affirmative, in respect of all animals which are likely to introduce cattle plague. Eastern Europe and all countries which permit the transit

of cattle from the eastern provinces are placed in the schedule; countries which are naturally free from cattle plague, and which are not countries of transit, are allowed to land cattle on our coasts in parts of ports which are not defined for slaughter, and these animals after being detained for twelve hours, or for such longer period as the inspector may think necessary, cease to be deemed foreign cattle, if they are free from any indications of disease at the expiration of the period of detention.

Should it happen that a case of cattle plague be detected amongst a cargo of foreign animal, all the animals of whatever kind would be slaughtered at the landing place. In the event of sheep-pox being discovered the sheep of the cargo would be slaughtered; other animals not being subject to the disease or likely to communicate it would be left free to move in any direction. Should pleuro-pneumonia be found, all the cattle of the cargo would be slaughtered; other animals, not being subject to the disease or likely to communicate it, would not be interfered with. Foot-and-mouth disease in any one animal of a cargo is held to be a sufficient reason for the slaughter of the whole cargo, because all kinds of stock are liable to suffer from the disease, and to communicate it to healthy animals.

Short of condemning all imported animals to slaughter at the water side, against which course cogent reasons have been over and over again advanced, no more severe restriction could be imposed upon foreign stock than those which are now in force.

Inspectors at the various ports have practically unlimited powers to detain animals of all kinds and all sorts of substances which they suspect to be dangerous; and we are in a position to state that they do not generally err by being too lenient. Indeed if a tenth part of the complaints which are made of their excessive strictness were circulated in the same way that charges of laxity are, a very decided impression would be left on the public mind in respect of the activity which is displayed in carrying into effect the sanitary laws for the protection of home stock. As it is, however, the public hears nothing of the numerous applications for

removal of onerous restrictions, knows nothing of difficulties which constantly present themselves for solution. Every vague charge or baseless report passes unchallenged, and agriculturists are being educated to believe that foreign animals are of no particular use to us, even when they are healthy, constituting an insignificant item of four and a half per cent. of our consumption, that the Privy Council frames all its regulations with the view to the introduction of foreign diseases; and that every facility is offered to the importers of foreign stock to the detriment of the home producer. This nonsense has been uttered so often, and has so long remained uncontradicted, that it is scarcely to be wondered at if many people have a sort of vague impression that they are unjustly treated. Why do not some enterprising importers establish a Foreign Cattle Defence Association whose office should be to protect foreign animals from the evil aspersions which are perpetually cast upon them; such an institution would do good service if it only disabused the popular mind of the idea that all foreign animals are "prolific sources of infectious diseases."

At any rate we should have both sides of the question represented, instead of as now being wearied by the constant repetition of the old story with always the same worn-out illustrations. We should, perhaps, among other things, learn something of the care which has been taken, and is now being taken, to improve the breeds of animals abroad, with a view to the requirements of the English market; of the systems of grazing and fattening on which we depend for a considerable portion of our meat supplies; and we might finally come to believe that good beef and mutton are not exclusively English institutions.

Extracts from British and Foreign Journals.

MODERN THERAPEUTICS.

In the course of his able address at the meeting of St. Andrew's Association already mentioned in the 'Medical Press,' the President, Dr. Day, of Stafford, adverted to the progress of medicine, which he regarded with hope and confidence. The recent advances in medicine and surgery were spoken of as illustrations of what had been done, and might be expected. On therapeutics Dr. Day said:

"Three remarkable progressions seem to my mind to distinguish modern therapeutics. The first consists in the study of the action of medicines by the investigation of the physical characteristics of each medicinal substance; the second consists in distinguishing the special action of different remedial substances on particular parts of the living organism; and the third consists in bringing the art of prescribing to the utmost simplicity, so that when we prescribe we know precisely on what we wish to rely for the good we would secure. All these methods of improvement hang closely together, and yet they are often distinctly pursued, not only by different men, but by men of diverse modes of thought. They are all good and productive of the best influences. It would be incredible to our forefathers to hear that we have men now, who—if you give them a chemical substance and tell them, this substance is composed of the following elements, it is of this specific weight, it is of this reaction, it is of this solubility, and it has certain other physical qualities therewith named—will tell you, in return, with an absolutely near approximation to the truth, what will be the physiological action of the said substance. Yet this is an accomplished fact, and, in the matter of those agents we employ to relieve pain, it has been one of the most fruitful means of the development of the triumph of human art over human suffering; a development belonging truly to the whole Christian era, but most to this latter-day section of that marvellous testimony of 'the ways of God to man.'

"Equally strange would it be to our forefathers to hear that we can now predict where a medicine shall, to speak plainly, go into the organism, and on what it shall act. Yet, in the case of some of our most potent agents, such as arsenic, nitrite of amyl, woorali, we know, when we give them, what will be the seat in which their influence or force

will be expended, as well as the nature or quality of that influence.

"Finally, to the most distinguished of the older prescribers how strange it would be to tell them, we give up that long list of agents that constituted your favourite formulæ; we are content to try one agent at one time; and as to your method of putting your medicines into the body by the stomach only, we, in our day, wise as serpents and gentle as doves, put them in by the skin if we like, with a sharp tooth, or instil them in the vapour by the lungs so subtly, that the administration is all but unperceived. Yet this, too, is daily done, and with a successful result undreamed of by the earlier pilgrims of medical progress, and certain amongst the historical steps of our time to remain."—*The Medical Press and Circular.*

ANALYSIS OF COWS' MILK TAKEN FROM THE ANIMALS WHILE ATTACKED BY TYPHUS.

The milk of twenty-two cows belonging to the same proprietor (of which number four were so badly attacked by contagious typhus as to necessitate the immediate killing of the same, while another batch of four were apparently quite well, and fourteen in a doubtful condition) has been investigated by the author. It appears that, as compared with the composition of normal milk, the milk of all these animals became more or less altered as regards the quantity of normal constituents, and may be termed very poor; yet, with the exception of the milk taken from the four cows which were very ill, there was nothing disagreeable about these samples of milk, and of the milk, which had got a bad taste and colour, a cat drank some 50 grams., without experiencing any bad effects. The author draws this conclusion, among others, from his researches—that neither the milk nor meat from cows so diseased can give the disease to men or other animals not belonging to the *Ruminantia;* yet, very properly, the author urges that severe measures should be taken to prohibit the use of milk as well as meat of cattle even suspected of being attacked by contagious typhus to be used as food; in fact, the milk, even at the first beginning of the disease, is entirely altered chemically as well as in its histological characters, as revealed by the microscope. Samples of milk:—A. From the apparently healthy cows. B. From the least ill. C. From the worst ill. The Sample A appeared to be milk in its

normal condition; the two other samples exhibited a yellowish rose-red hue, and the taste of Sample C was very disagreeable. In 1000 grms. the samples contained—

	A.	B.	C.	Average Composition of Milk in its normal state.
Butter .	16·96	14·93	12·60	30
Milk sugar	33·90	31·40	16·45	50
Casein .	,,	50·25	,,	34
Albumen .	,,	20·60	,,	6
Salts .	,,	18·50	,,	7

—Dr. Husson, *ibid.*

OBSERVATIONS AND EXPERIMENTS WITH THE MICROSCOPE ON THE CHEMICAL EFFECTS OF CHLORAL HYDRATE, CHLOROFORM, PRUSSIC ACID, AND OTHER AGENTS, ON THE BLOOD.

By Thomas Shearman Ralph, M.R.C.S. Eng.

On a former occasion, now five years ago, I had the honour of reading before the Medical Society of Victoria a paper entitled "Observations and Experiments with the Microscope on the Effects of Prussic Acid on the Animal Economy," in which I pointed out the specific or chemical action of that agent on the blood, viz. that the iron was laid hold of by the cyanogen, and the result was the formation of prussian blue, or some cyanic compound of iron. Accompanying this remarkable change was another, which I also pointed out, that certain oval bodies, closely resembling starch grains, were formed. These bodies turning blue under the action of iodine, and polarizing, were seen to form in the field of the microscope.

After my communication on the effects of prussic acid I investigated the action of another chemical agent, which exhibits decided effects on the corpuscles of the blood when applied to them out of the body; namely, ammonio-sulphate of copper. When blood is allowed to flow into a solution of this compound, it is found that the contained matter of the red corpuscles cannot pass out; for when blood is drawn and placed in a thin film on glass, and examined under the microscope, it is found that the major part of the corpuscles gives up the contained matter, and the empty cell walls or coverings remain behind. This is well seen on applying a solution of magenta to blood under the microscope; the field becomes occupied by a vast amount of granular matter, coloured red by the dye; while the cell walls or envelopes lie in abundance uncoloured, or at the most presenting to the

eye of the observer the red molecule first pointed out by Dr. William Roberts, of Manchester, in 1863, and also brought further into notice by Professor Halford, in 1864, before the Australian Society.* My experiments with this agent, ammonio-sulphate of copper, go to show that, while the corpuscles are so acted on that they cannot pass out their contents, yet when magenta is applied this dye can pass in and colour them; and this coloration shows by its tint the degree of emptiness or fulness of each corpuscle, proving that at the moment when the cupreous solution was added to the fresh-flowing blood the corpuscles were in different conditions, some perfectly full, while others were partially empty. By means of water the cupreous compound can be washed away, and then these same corpuscles are able to part with their contents, as they do under ordinary circumstances.†

Subsequently I offered some observations on the action of snake poison on the blood, *i. e.* that it could be compared to that brought about by prussic acid; that this agent, while it attacks the iron in the blood, yet sets up a further action—that of causing the newly formed red corpuscles to retrograde, as it were, to the condition of the white.‡

Here are three important chemical agents, which have been applied to the blood in order to elicit information regarding either its structure or its chemical character, namely—

Magenta; which was first taken in hand, and which attacks the nuclei of the white corpuscles and colours them; also the granular matter exuded from the red.

Ammonio-sulphate of Copper; which prevents the egress of the solid portion of the red corpuscles; while at the same time magenta can pass in and colour them effectually.

Prussic Acid; which lays hold of the iron in the blood, withdrawing it from some organic state of combination, giving rise also to the formation of corpora amylacea, or starchy bodies, by some further change effected on the blood constituents.

I feel it is necessary thus to enter upon a *résumé* of what has been done, in order that what follows may be rendered more clear, and that the minds of those to whom I address myself may be satisfied that all the following observations and experiments have proceeded *gradatim*, and owe their origin, and are connected, with my former labours in this field of observation.

* 'Australian Medical Journal,' vol. ix, 1864.
† Ib., vol. xi, 1866.
‡ 'Australian Medical Journal,' vol. xii 1867.

In bringing forward the present communication, I feel more and more satisfied of the importance of that mode of investigation which I have employed, that it is one which opens another avenue to the study of physiology, as well as leading us to the ultimate or chemical action of agents on the animal economy.

Experience and observation, based on the separate and combined action of the above-mentioned agents, have satisfied me that some reliable chemical effects may be traced out regarding other agents, whose action on this portion of the animal economy is as yet unknown.

The difficulty hitherto has been to find an agent the effects of which either exceed or distinctly differ from those of any substances hitherto recognised; while, at the same time, the nature and probable action of the new agent should be such as we can trace out without encountering serious difficulty as to its interpretation.

I now proceed to the demonstration of some chemical changes in the blood produced by means of different agents, the effects of which have been hitherto entirely unknown, and which will prove suggestive to the mind of the medical practitioner as soon as he shall have presented to him a further series of experiments carried out after the mode of investigation which I have endeavoured to follow, namely, the general action of a chemical substance on the blood withdrawn from the body, and traced out by the microscope; and also the investigation of the action of the same agent on the blood after it has circulated through the animal economy, having been thereby subjected to the continuous action of air during its passage through the lungs. In the former instance we obtain a general kind of action on the blood; in the latter, more positive or distinct effects are presented to our notice, as I shall endeavour to point out by-and-by.

The examination of the blood drawn from the circulation and subjected to the action of a chemical agent does not suffice to show us all that may be produced on it by that agent, and we need, if it is possible, to ascertain and compare its effects after it has circulated in the system. This is true, however, only to a certain extent, for we know that magenta has a remarkable effect on the blood when added to it; but we find no trace of its effects on that fluid when we inject it under the skin, or pass it into the stomach with a view to its absorption and subsequent action on the blood, as the experiments of Professor Halford go to show.

I now pass on to the examination I have made of the action

of one important chemical agent, which has only lately been brought before the notice of the medical profession, both here and at home, or rather in Europe. I mean chloral, or, as its more chemical name is supposed to be, "Trichloric Aldehyde." This substance is now in use as a hydrate, and its action has been stated to be somewhat like chloroform. When an alkaline solution is added to it, chloroform is set free; hence its proposer, Liebreich, suggested its use: that meeting with alkaline elements in the blood, it might become decomposed into chloroform. This theory, which is a very taking one, was, no doubt, the cause of the experimental use of this substance. The general experience, however, of the profession is against the idea that it acts as an anæsthetic, but only as a true hypnotic.

I feel inclined to the opinion that, though it appears almost certain that chloroform is eliminated in the blood by its decomposition, yet that the action of that agent is considerably modified by the attendant chemical change which necessarily accompanies the decomposition of this agent in the blood. If it is correct that the hydrate of chloral is decomposed by the alkaline state of the blood, then it follows as certainly that the resulting compounds must be chloroform and a formate of some alkali. And if we regard the presence of alkalinity to be normal in the blood, then we obtain not only the chemical or physiological action of chloroform, but we have also to consider what may be the physiological effect of the formate of an alkali, whether of ammonia or potassa, and on such grounds we may fairly deduce that the physiological effects of chloral on the animal economy must be somewhat different to that of chloroform by itself; hence, perhaps, hypnotism, in place of anæsthesia.*

At the risk of being tedious, I now approach the demonstration I have proposed to make, by reference to the line of my own experience in this matter; and I extract the fol-

* The decomposition of chloral hydrate by ammonia is curious to witness when carried out in the following manner:—A solution of the hydrate should be placed in a narrow tube, about seven or eight inches long, and ammonia added, and the mixture shaken and slightly warmed, when a white cloudiness will make its appearance, and bubbles of gas rise to the surface. If now a little superstratum of water is added, and not allowed to mix with the contents of the tube, the bubbles of gas will be seen passing through this stratum of water, and with a pocket lens the decomposition will be well seen. So soon as a bubble reaches the surface and disappears, from that point there descends an oily looking fluid (chloroform); but before this reaches the cloudy portion, an amorphous or semi-crystalline material is formed—formate of ammonia; what the gaseous portion is I have not ascertained.

lowing from my microscopical note-book:—"August 22nd, 1870.—Hydrate of chloral is a remarkable chemical substance, producing a singular effect on the blood when applied directly to it. A small portion placed on a glass slide and slightly moistened, and then fluid blood added; about one third of the corpuscles appear to corrugate their solid contents, which then take colour from magenta."

This was the first fact which attracted my notice: the red corpuscles of the blood, when acted upon by magenta, under ordinary circumstances pass out or give up their contents, which then become coloured by the dye. In this instance the dye penetrated the corpuscles, and coloured the material within them.

This effect was sufficient to indicate to my mind the remarkable chemical action of hydrate of chloral; and having made a note of it, I waited until this agent was within my reach for further experiment, for when I made this observation I could only obtain a few grains of it for experimental purposes.

In the following October I had occasion to administer it in small doses, with the view of relieving pain. This enabled me to examine the condition of the blood. The blood, drawn two or three hours after its exhibition, presented a remarkable appearance. In several parts of the field of the microscope, besides *garnet-coloured amorphous particles*, a number of *red-coloured globules* (double the diameter of white corpuscles, and many smaller) were seen; some of these were dark red. This was experiment the first.

Experiment 2.—Hydrate of chloral was exhibited by the stomach to a rabbit; within an hour red masses were seen in the blood, also the presence of starchy bodies was noticed.

Experiment 3.—A frog was subcutaneously injected with hydrate of chloral, with the same results.

Experiment 4.—Frog immersed in a four-grain solution of the hydrate for some hours, when it was found hypnotic. Blood, nuclei of corpuscles appeared greenish, red particles also seen.

Experiment 5.—Frog killed by hydrate of chloral, after some hours of sleep. Blood from heart decidedly tinged redder than usual; some corpuscles presented reddish dots on their surface; red-coloured masses were noticed all through the blood, as seen before.

Experiment 6.—On self. Three grains of hydrate of chloral were taken about two hours after a meal; the blood was examined every quarter of an hour; at the end of an hour it

exhibited decided reaction; blue as well as red particles were seen. When the blood had dried on the glass slide and under the covering glass (which was about two hours after), some spaces, where coagulation had taken place, were filled with fluid presenting either a bluish or reddish tint. The urine also exhibited some dark-coloured and reddish particles.

Experiments 7 and 8.—Two rats were killed, one by chloroform, the other by hydrate of chloral, injected subcutaneously. This last took a grain and a half before deep sleep was induced. Blood exhibited ruby-red particles; a few bluish; also starchy bodies in abundance. The urine also showed the same.

The chloroformed rat.—Urine with abundance of starchy bodies, and some blue-coloured particles; blood from lungs—plasma reddish; few starchy bodies; some blue particles; *scarcely* any reddish.

Experiment 9.—Rat injected with hydrate of chloral. Deep hypnotism; blood gave the same results; starchy bodies and red-coloured masses. Ammonia inhaled appeared to increase the production of the red matter. A solution of ammonia injected under the skin appeared to give rise to bright red smears, or fluidity, between the corpuscles. The blood, under the action of ammonia, in both forms of exhibition, seemed to have assumed a redder tint than usual.

Experiment 10.—A newly born rat was placed in a solution of hydrate of chloral. After some hours the blood exhibited redness in the liquor sanguinis; also some fine red particles and red patches.

Experiment 11.—Hydrate of chloral was evaporated from a slide on to fresh blood held over it; bright red-coloured particles were formed in it.

Experiment 12.—Blood exposed to the vapour of chloroform gave some evidence of red-coloured matter. It appeared to me, at this point of my experiments, that the chemical action of hydrate of chloral on the blood was mainly due to formyl, or formic acid, produced by its decomposition. When more ammonia was introduced into the experiment, a larger production of the red material resulted.

Experiment 13.—Formic acid (obtained from ants) added to blood gave rise to the formation of dark red globules and particles.

Experiment 14.—Lactic acid added to blood yielded red particles; these appeared to increase on the addition of prussic acid; the fluid or plasma appeared redder.

Experiment 15.—Blood, with prussic acid added, and then oxalic acid, yielded red-coloured particles.

Experiment 16.—Blood exposed to vapour of hydrate of chloral gave red particles as before; these lost their colour on addition of oxalic acid.

Experiment 17.—Prussic acid and ammonia were mixed together on a slide, and fresh blood added; red particles made their appearance; no starchy bodies; blood-corpuscles and plasma redder than usual.

Experiment 18.—Blood, exposed to ammonia vapour, became slightly reddened; prussic acid added in fluid form; blood became decidedly redder; red particles and red plasma resulted.

As far as these experiments had gone, I considered it reasonable to conclude that the decomposition of hydrate of chloral in the blood gave rise to the liberation of formyl, or else formate of ammonia. But what becomes of it? Is it likely to remain in a free and uncombined state? or rather does it not combine with that important element in the blood —iron, producing a formate of iron; or perhaps ammonio-formate of iron?

These decompositions in a highly complex material, as blood, are most difficult of explanation; and it is here I feel we must advance with caution.

The next point to which I directed my attention was to ascertain the action of hydrate of chloral upon a salt of iron; and the following experiments appear to me to support the view I have just expressed.

Experiment.—Chloral dissolved in a little water with ammonia added, was followed by the decomposition of the former; a crystal of sulphate of iron was added, and the effect watched under the microscope; red-coloured particles and amorphous masses of different depths of tint, closely resembling those seen in the blood in the forementioned experiments, made their appearance.

A solution of ammonio-citrate of iron also gives similar results, and somewhat similar also is the action of prussic acid and ammonia conjointly acting on a salt of iron.

Again, being aware from experiments performed in times past, that the presence of iron in vegetable tissues was demonstrable by means of prussic acid and prussic salts, I proceeded to make the following experiment, which, if it does not convince by its single testimony, yet is to my mind highly satisfactory; it is also one of the most remarkable of the kind which I can adduce, in relation to chemical action on vege-

table tissues as revealed by the microscope; when once witnessed it can never be forgotten.

Experiment.—A section of a tender vine was made and placed on a glass slide with water, and chloral hydrate added; a reddish tint pervaded some of the cells; but when ammonia and chloral were added together, the tissue became tinged with a dirty red.

Again: prussic acid and ammonia combined were added to another vine section, and produced a most beautiful and striking reaction. The woody ducts were seen filling up with bright red fluid. In both these instances I have no doubt formyl, or formic acid, attacks the iron combined with the fluids or tissue of the plant.

I can adduce a number of similar experiments, carried out with the same chemical agents, which more or less yield evidence of a similar kind of reaction; but this would prove tedious and superfluous.

I now proceed to sum up my experiments. Hydrate of chloral administered by the stomach or subcutaneously injected, gives rise to the production of bright red or dark red particles, masses, or globules in the blood. Starchy bodies are also met with accompanying these charges. The urine also exhibits these bodies. The same results follow when vapour of hydrate of chloral is applied to fresh-drawn blood.

Ammonia, administered by the lungs, or subcutaneously injected during the action of hydrate of chloral on the animal economy, appears to heighten these effects.

Formic acid added to fresh blood also causes the production of dark red globules and particles.

Lactic acid conjoined with prussic acid does the same.

Prussic acid and ammonia conjoined yields the same results.

The action of hydrate of chloral, while decomposing under ammonia on a salt of iron, presents changes which to my mind are identical.

The chemical effects of hydrate of chloral and ammonia, of prussic acid and ammonia, on some vegetable tissues, appear to be much the same in character as those produced in the blood, minus, of course, the solid albuminous matter. All these results I refer to the action of formyl or ammonio-formate on the iron in the blood, or in the vegetable tissues.

The decomposition of lactic acid with prussic acid can supply chemically the elements necessary for the production of formyl or formate of ammonia; as also prussic acid and ammonia.

There are one or two more experiments to which I must refer, *i. e.* the chloroformed rat, in which the blood was noticed to be reddish, but scarcely any red matter was seen. It would appear the chemical condition of the blood is not capable of readily decomposing chloroform; such also is the case, I believe, with hydrate of chloral applied to the blood out of the body; but when the vapour of chloroform or the hydrate of chloral is applied, then the red particles make their appearance.

Here is another remarkable occurrence which receives its solution from the forementioned experiments. Some blood was accidentally examined after wine (Reisling) had been taken; this was with the view of exhibiting the action of prussic acid on iron in the blood; but it was noticed little or no reaction could be found after its application; but a good many red-coloured globules and particles were seen, just as if chloral had been taken. In consequence of this, a small drop of the wine was added to a little blood fresh drawn; the changes seen under the microscope were most remarkable. Abundance of globules of a dark red or brown colour made their appearance, as also red amorphous masses or particles. Gas also was given off in the neighbourhood of the globules. Some of these bubbles contained a bluish fluid; the nuclei of the white corpuscles were bluish.

The experience I have already gained in carrying out these experiments leads me to see that the condition of the blood recognisably varies from day to day, from the effects of food, &c.; for the varying degrees of success which have attended a number of experiments performed with the same chemical agent, on the same individual, point to the great probability of the variable condition of the blood, when that individual has been the subject of variety in diet, or degrees of fatigue of mind or body.

Another consideration which presents itself to my mind is, that just as we now test the condition of the urine in order to ascertain what is being eliminated from the body of a patient, so will the physician find it useful occasionally to test, by means of reagents, the condition of the blood of his patient, in order to verify the character of some obscure symptoms. Even at this period of my experience I have reason to believe it is possible, by means of agents previously administered, to prolong the hypnotic action of chloral, or to prevent or modify it in a great degree.

Thus, I believe, I have at least been able to give demonstration to the theory of Liebreich, who, by his chemical knowledge, has enabled the medical practitioner to employ a

remarkable agent, one which promises to be a sister companion to chloroform in alleviating the ills to which flesh is heir. I hope I may be fortunate enough to arouse the attention of my professional brethren to the investigation of the chemical action of remedies on the blood, and thereby, perhaps, lead on to a more rational and satisfactory mode of treating some diseases, which in time to come, I believe, will be attacked directly through the blood itself.—*Read before the Medical Society of Victoria.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

SPASMODIC COLIC IN THE HORSE.

By M. Bollinger. Translated by Alexander S. Rolls, M.R.C.V.S., Arundel.

In the *Recueil de Médecine Vétérinaire* for May and June, 1871, M. Auguste Zundell, of Mulhouse, in his *Veterinary Chronicle of Germany,* reviews a recent work of M. Bollinger, Professor at the Veterinary School of Zurich, which he says "seems to promise to overturn all our knowledge of one of the most frequent diseases of the horse, *i. e.* colic. Prof. Bollinger shows that the intestinal congestion accompanying the majority of these cases is due to the stoppage of an embolism in the ramifications of the anterior mesenteric artery, which embolism is due to a verminous aneurism found in the large trunk of this artery, near its origin from the posterior aorta.

The extraordinary frequency of these aneurisms in the horse has been recognised, first by Hering, and since by Rigot, Rayer, Bruckmüller, and Bollinger. The result of these researches is that the number of horses having these arterial aneurisms is greater than those without, and often there are several in the same animal. M. Bollinger admits that in 200 horses there are 168 aneurisms, of which 153 are of the anterior mesenteric, 4 of the cœliac arcis, 3 of the renal artery, and 2 of the posterior aorta. In 100 adult horses you find 50 to 54 having an aneurism of the mesenteric arteries. Morgagni, Ruysch, Hodgson, Grene, had already attributed these aneurisms to the action of the *Strongylus armatus* found so frequently in the cavity of the dilated vessel.

Davaine, Leuckart, Leisering, Roell, Bruckmüller, equally admit the pathological influence of these worms, but it is M. Bollinger who has thoroughly established the direct correlation between these worms and the aneurisms. This helminth, before penetrating the digestive tube, is for some time a blood worm, inhabitating the dilatations of the artery, and there undergoes a metamorphosis, for on its first appearance it is but a third of its full size, and, instead of presenting a coronet of sharp teeth, its head is ornamented with an arrangement resembling the petals of a rose; it is in the larval state, and has rudimentary genital organs; when it arrives at its full development, after changing its skin, it leaves the aneurism, is carried along with the current of blood, and penetrates the intestine.

These anterior mesenteric aneurisms differ slightly in their anatomical structure from ordinary aneurisms; they are formed by a thickening of the subperitoneal cellular tissue, with obliteration of the vessels of the part; the internal tunic is thickened and the middle hypertrophied; the tunic is sometimes reabsorbed, and is always highly inflamed and altered; sometimes it has undergone fatty atheromatous or calcareous degeneration. In the interior there is ordinarily a clot of blood, an adherent thrombus of variable consistence, more or less filled with strongyli, obliterating to a greater or less degree the canal of the vessel, but always presenting a passage through the centre. Often this thrombus is prolonged into the artery on either side of the dilatation, and floats in the current of blood.

This aneurismal thrombus increases in size by the adherence of coagula of fibrine. Under the influence of a cause, sometimes difficult to recognise later—for example, by too cold a draught of liquid, which produces a general shock of the system, or of an excess of food, provoking an overflow of blood—portions of the coagula or even fragments of the thrombus are detached and carried along by the circulating current, to become arrested in the ramifications of the artery, forming an embolism at some bifurcation. Now, the experiments of MM. Colin and Panum have proved that embolism of the mesenteric arteries produce a stagnation of blood in the interested portion of the intestine; the mucous membrane particularly becomes gorged and admits exudations; the portion of the intestine seems paralysed and does not perform its functions.

In consequence of the non-arrival of arterial blood through the embolism, we see in the neighbourhood of the choked vessel a great stagnation of venous blood with transudation of

bloody serum, causing considerable tumefaction of the walls of the intestine and the mesentery, and larger or smaller spots of hæmorrhage, and sometimes an outpouring of blood in the intestinal tube. As a sequel of this passive congestion of the intestines paralysis takes place in them, the progress of their contents is stopped, and tympanitis soon becomes a complication. Let us prove that these are the symptoms and lesions we find also in intestinal indigestion, in red colic, and in this disease, which for a long time we have wrongly attributed to active congestion or to enteritis. Let us remark that the arteries of the colon and cæcum, which are the most exposed to embolisms from the ordinary anatomical disposition of the aneurism and thrombus, are also the portions of intestine most exposed to colics by congestion.

When but small portions of the thrombus are detached, which is oftenest the case, we find it plugging but a small vessel, and then only a small portion of the intestine is paralysed, and the colic but slight and transient. Soon the blood finds a collateral way, and the viscus resumes its normal functions. Sometimes several branches of the artery are obstructed at the same time, and then the anatomical alterations are more serious, and a longer time is necessary to establish a collateral circulation. At other times the obliteration is incomplete, and the functional derangement will be less serious. If fragments of the thrombus are detached from time to time, we have remittent colic, more or less chronic. The gravity of the functional derangement and of the colic will depend on the difficulty of establishing a collateral circulation. This gravity, this re-establishing of the circulation, does not depend, however, on the dimension of the vessels; often it is feebler in the large ramifications of the artery than in the small, and this explains how a colic which appears very serious may speedily abate, and how another which appeared mild may take some time to cure, and produce the usual complications.

Let us remark, in order to explain the general gravity of colic due to intestinal congestion, that the mesenteric arteries help but very little the collateral circulation, which is, however, their sole means of cure. Whilst other organs receive arterial branches from several sides, and oftenest from every side, the branches of the mesenteric anastomose with neighbouring arteries only on two sides, anteriorly and posteriorly, and always with branches of the same trunk.

Often the collateral circulation which is established is insufficient; then intermittent colic takes place, which is

attributed to chronic affections of the intestines, and which are often accompanied with diarrhœa and hinder the animal from being well nourished.

On *post-mortem* examinations of horses which have died from colic it is not always easy to find the point where the artery is obliterated, nor to find the embolism which is the cause of the evil. The great development of the intestinal vessels, and, above all, their general injection, makes the search difficult, and great patience is necessary to find it.

On making the autopsy of horses which have recovered from colic of this nature, after a longer or shorter period, we find in the peripheral vessels of the anterior mesenteric, as well as in the corresponding veins, old lesions in the form of thrombus; these vessels are more or less obliterated, and around there is ordinarily pigmentary deposit in the peritoneum and other tissues. M. Bollinger says that on a square *centimètre* he has sometimes found five to six arterial twigs on small veins thus obliterated, and M. Bruckmuller has equally noticed them, without, however, attributing them to the lesions of colic.

Let us remark, also, that colic produced by an embolism may be influenced by other etiological phenomena. Food which easily undergoes change, and which rapidly gives rise to large quantities of gas, aggravates the disease; so it is if the embolism occurs at the time of digestion, when the viscera are full of indigested food.

M. Bollinger is far from wishing to explain every case of colic by embolisms. He admits readily that they may be due to evils in feeding, to bad fodder, to the various forms of calculus, to intestinal worms, to the action of poisons, or to the effect of hernia or of volvulus. He does not, however, admit that colic is due to enteritis, unless caused by poisons or miasma, and he supports his opinion by the fact that in man and all the other domestic animals enteritis is slower and, above all, more regular in its course than that observed in the horse, and often in this same animal we find true enteritis not accompanied by colic.

Let us remark that observations on obliterations of the mesenteric artery by fibrinous clots, corresponding to aneurisms, have been occasionally published by veterinarians. Thus, in the *Recueil* for 1829 there is one by Rigot, in that of 1830 one by Héring, and in that of 1853 another by Reynal. In the *Vierteljahrsschrift of Vienna* for 1860 and 1861 there are two observations by M. Bruckmüller, and in the *Journal des Vétérinaires du Midi* of 1867 an observation by MM. Bonnaud and Andrieux. In all these

cases the coexistence of colic has been noticed, only no one has thought of attributing the colic to the embolism or believed they ought to generalise the pathological phenomenon, but the case has been considered rare and exceptional.

I will add that the idea of no more attributing colic, accompanied by intestinal congestion, to enteritis, has already cropped up several times, and some have sought to consider the stagnation of blood as altogether passive. M. Colin attempted, some years since, to attribute the intestinal congestions of horses to an obliteration of the portal vein, or compression of this vessel by great distension of some part of the digestive apparatus. I (Zundel) in order to explain the good effects of spirit of turpentine in this kind of colic, admitted long ago, as a commencement of the colic, paralysis of the intestine and cessation of the peristaltic movements under the influence of an unknown cause.

In a recent memoir on active mesenteric and intestinal congestions in the horse, M. Hamon has appeared to us equally to contest the true inflammatory character of these diseases. Several of my practical friends have long since, in conversation, expressed their disbelief in true enteritis occasioning intestinal congestions.

The labours of M. Bollinger now give a solid basis to these opinions, and are, as I said at the commencement, capable of completely changing the generally admitted ideas on this question. On the other hand, in attributing the greater number of colic cases in the horse to the effects of parasites, these researches of M. Bollinger direct the attention of veterinarians to the extraordinary frequency of the *Strongylus armatus*, and call on them to take means to arrest its propagation.

ROYAL COLLEGE OF VETERINARY SURGEONS.

January 3*rd*, 1872.

Benjamin Cartledge, Esq., President, in the Chair.

Present—Professor Simonds, Professor Brown, Assistant-Professor Pritchard, Mr. Wilkinson, Mr. Fleming, Mr. Silvester, Mr. Cowie, Mr. Naylor, Mr. Burrell, Mr. J. C. Broad, Mr. Harpley, Mr. Moon, Mr. Withers, Mr. Cartwright, Mr. Owles, Mr. Balls, Mr. Robinson, Mr. Field, and Mr. Coates.

The minutes of the previous meeting were read and confirmed.

The President: Our first duty to-night, this being our first meeting since the loss the profession has sustained by the death of Professor Spooner, will be to resolve that a letter of condolence be sent from this Council to Mrs. Spooner. Great as has been the loss to the profession by the death of Professor Spooner, the loss to his family, of course, is very much greater. We have all known him for many years, and he has taken a very active part in the profession for a long time, and his death has left a gap which time, perhaps, alone may fill.

The Council adopted the President's suggestion, and the Secretary was directed to write the letter.

The Secretary presented to the College specimens of the mouths of horses, to be used in testing the knowledge of candidates at the examination tables. The specimens were originally given to him by Mr. Broad, and he had worked them up into a form and mounted them suitable for presentation to the College.

On the motion of *Mr. Wilkinson*, seconded by *Mr. Silvester*, a vote of thanks was accorded to the Secretary and Mr. Broad for their valuable presentation.

Professor Brown suggested that if the specimens were to be used as tests for the students, it would be desirable for a committee to decide exactly as to the ages which they represented.

The following letters were read:

(1) From Mr. C. Lowe, expressing his regret at being unable to attend the meeting.

(2) From Mr. Roberts, of Bristol, who wished to be informed whether or not a member of the Pharmaceutical Society could be prevented from styling himself a veterinary surgeon. In reply, the Secretary had stated that there was no law to prevent it so long as he did not assume the title of Member of the Royal College of Veterinary Surgeons.

(3) From Mr. Newman, asking if any person of the name of Adams was a member of the Royal College of Veterinary Surgeons besides the two whose names were entered on the first page of the Register. He had been informed, in reply, that no other persons of that name were members of the Royal College of Veterinary Surgeons.

(4) From Mr. G. Armatage, Secretary of the Veterinary Medical Society, conveying the unanimous thanks of the Society to the Council for the loan of their room for the ensuing year.

(5) From Mr. Wm. Salmon, of Montreal, stating that he had been practising as a veterinary surgeon for a great number of years, and was desirous of obtaining the diploma of the Royal College of Veterinary Surgeons, but was too old to undergo an examination.

The Secretary said he had referred to the Scotch Register, and had found that Mr. Salmon held no certificate from the Highland and Agricultural Society.

The Secretary was directed to state, in reply to Mr. Salmon, that as he held no certificate, he was ineligible for presenting himself before the Board of Examiners.

(6) From Colonel Fitzwygram, enclosing cheque for £5 for special examination fee.

(7) From Professor Williams (Edinburgh), certifying that Colonel Fitzwygram obtained the certificate of the Highland and Agricultural Society in April, 1854.

(8) From Mr. Cowie, through whom application had been made to the Secretary on behalf of Mr. William Smith, holding the Highland and Agricultural Society's certificate, who wished to become a candidate for the diploma of the College. Mr. Cowie had been asked to request Mr. Smith to make his application direct to the College.

Professor Simonds drew attention to the reply which had been sent to Mr. Roberts, of Bristol. He considered the reply incorrect. The Charter distinctly stated that "the members of the said body politic and corporate, solely and exclusively of all other persons whomsoever, shall be deemed and taken and recognised to be members of the said profession or professors of the said art, and shall be individually known and distinguished by the name or title of veterinary surgeons."

On the motion of *Mr. Fleming*, seconded by *Assistant-Professor Pritchard*, the Secretary was directed to write to Mr. Roberts, stating that since his former communication he had referred to the terms of the Charter, and had received the instructions of the Council to send him the extract from the Charter relating to the question which had been asked.

The Registrar read the report of the recent examinations, at which 15 candidates passed and 9 were rejected.

At a special meeting of the Board of Examiners, held October 18th, 1871, Mr. John Gillespie, of Upper East Smithfield, London (holding the Highland and Agricultural Society's certificate, bearing date 1856), obtained the diploma of the College. In thanking the Board for his diploma, Mr. Gillespie stated that he had desired to have it in order to assist him in obtaining a public appointment.

At the meeting of the Veterinary Board of Examiners, held December 19th, 1871, written examination papers with answers were laid before the Board, from Colonel Fitzwygram, together with a letter from Professor Williams, of Edinburgh, containing a duplicate copy of Colonel Fitzwygram's Highland and Agricultural Society's certificate.

The Registrar read the obituary notices.

The report of the Finance Committee and the Treasurer's account were brought up. The present liabilities were £79 10*s.* 6*d.*; balance at bankers' on 1st January, 1872, £185 16*s.* 6½*d.*

On the motion of *Mr. Cartwright*, seconded by *Mr. Naylor*, the report and statement of accounts were received and adopted.

Cheques were ordered to be drawn to meet the current expenses.

The Secretary brought up the report of the House Committee, on an application from the Secretary of the Central Veterinary Medical Society, requesting to be furnished with a statement of the expenses incurred by the Society in the use of the College rooms. It stated that the House Committee had taken into consideration the consumption of gas and coals, and had fixed the expenses at 2*s.* 6*d.* per night.

Some discussion followed as to the advisability of charging a fixed annual sum instead of the 2*s.* 6*d.* per night, but ultimately the report of the House Committee was received and adopted.

On the motion of *Mr. Silvester*, seconded by *Mr. Wilkinson*, an amendment, proposed by *Professor Simonds*, and seconded by *Mr. Field*, to refer the report back to the Committee, was negatived,

Mr. J. C. Broad, in proposing the motion, of which he had given notice, "to consider the propriety of continuing the Christmas examinations, and also to raise the examination fees," said, as a member of the Finance Committee, it had been brought under his notice that the Christmas examinations had been attended by a loss, and he therefore wished the Council to consider whether, under those circumstances, it was advisable to continue them. In 1862, there was a loss of £14 13*s.*; in 1864, £10 14*s.*; in 1865, £3 7*s.*; in 1866, £32 19*s.*; in 1867, £22 4*s.*; in 1868, £22 4*s.*; in 1869, £21 8*s.*; in 1870, £22 9*s.*; and in 1871, £27 9*s.*; making a total loss of £165 17*s.* 4*d.* in nine years, or an average of £18 8*s.* 5*d.* per year.

Professor Simonds: What has the College received at the other examinations to meet this loss?

Mr. Broad said he had not reckoned that up.

Mr. Wilkinson said, as the motion was at present worded, it would be impossible to take any action upon it, but quite enough had been said to justify Mr. Broad in moving that the Christmas examinations should be discontinued, and that the fees should be increased.

Professor Simonds said the second part of Mr. Broad's motion affected a bye-law, and therefore could not be moved at this meeting.

Mr. Moon drew the attention of the Council to the fact that Bye-law 25 would be affected by the first part of such a motion.

Mr. Wilkinson asked the President's opinion on the question at issue. The members of the Council had been summoned together for a special purpose—to discuss Mr. Broad's motion, but it turned out that the motion was only to "consider." No decision could, of course, be come to on such a motion, but it would be a pity to have the discussion postponed. If nothing was done that evening the whole matter must occupy six months instead of three, for after discussion at the end of three months the motion would have to wait another three months before it could be confirmed. When there was such a large gathering of members it was a pity to separate without taking some notice of Mr. Broad's motion.

The President: My opinion is that the Council simply has power to discuss it. I question very much how far any action taken by the Council to-night would be legal. At the same time I hardly see, myself, how it would forward the ultimate object Mr. Broad has in view if we were to discuss the subject to-night without being able to arrive at any result.

Professor Brown said some expression of opinion by the Council would be of great advantage to Mr. Broad, as it would enable him to see clearly how far he was likely to succeed if he proceeded with his object.

Professor Simonds: But you cannot take any action on it.

The President agreed with Professor Brown that a discussion might, perhaps, facilitate Mr. Broad's object, though, of course, no legal result could be accomplished.

Mr. Wilkinson said he was of opinion that the subject ought to be discussed, and, if the President would permit him, he would state what he thought of Mr. Broad's two proposals. His first proposal was to do away with the Christmas examinations in consequence of the expense. Although there might be a loss, he did not consider that, in itself, that would be a sufficient reason for discontinuing the examinations if they

were of value in other respects. It might so happen that only one night would be required for the examinations, and in one sense that would be an advantage to the College, but on the other hand it would give the examiners a great deal of trouble to come up to the examination at an inclement season of the year. He did not see that there was any very powerful argument in favour of dispensing with the Christmas examinations. With regard to the increase of the fees, he was of opinion that if the time were propitious it would be a very judicious step to take, but he had reason to feel that the present would be a very improper time to make such an alteration. In many respects they were, both in England and Scotland, in a state of transition, which, perhaps, in a short time might come to an end, and then the time would arrive when a fair discussion might take place and an alteration be made, with the consent of all the schools, for in this matter it was necessary to have that consent.

Professor Brown said he regarded the question of the expense of the Christmas examinations as very insignificant, and probably the loss would be altogether got rid of if the balance for the entire year were taken, but one important point connected with the subject was this. When a candidate was rejected it was assumed that there was always a very good reason for the rejection, and it was exceedingly desirable that a candidate once rejected should not again present himself until he had had an opportunity of passing through another complete course of study. On this ground, and on the assumption that there was only one sessional course of study at the College, he was altogether in favour of holding the examinations only once a year. With reference to raising the fees, he should certainly have been prepared to support a motion in its favour, had it not been for what Mr. Wilkinson had just stated. If, from his special sources of information, Mr. Wilkinson was aware that the proceeding would be objectionable to the schools at present, and would probably interfere with the amicable feeling existing between the two sections of the Board, that would probably be quite sufficient to induce Mr. Broad at present to refrain in that particular. At the next quarterly meeting it would be his duty to ask the Council to allot certain moneys in order that he might have an opportunity of testing the candidates in practical pharmacy and dispensing. As the matter now stood, he had only about five minutes' conversation with each pupil, during which time he was supposed to be able to ascertain whether or not he was competent, and he should therefore ask for a small grant of money to enable him to

test the candidate fairly. In the face of what Mr. Wilkinson had said, he thought that while the Christmas examinations might be a matter for further discussion, the question of increasing the fees had better be postponed, and he was also rather inclined, from circumstances which had come to his knowledge, to recommend that any proposal for alteration in the examinations had better be waived for the present.

Mr. Owles said he did not think students rejected by the Scotch section of the Board of Examiners had an opportunity, equally with the London students, of presenting themselves for re-examination at Christmas. If this was so, they might with some justice say that they were placed at a disadvantage. During the last few years the Council had done a great deal to consolidate the profession and remove all grievances, and it was therefore very desirable that all possibility of being misunderstood should be done away with. He had never heard a complaint made, but the Scotch students might fairly make it.

The President said there were no examinations in Edinburgh in December, and it certainly was the cause of some soreness with the Scotch schools.

Professor Simonds said the bye-law distinctly stated that there should be an examination at Christmas; it had, however, not been asked for by the Scotch schools.

Mr. Fleming: I am afraid if this examination at Christmas were asked for in Scotland the Royal College of Veterinary Surgeons would soon come to grief. I think that the one examination is quite sufficient, and that the little saving we shall have will go to assist in forwarding the other examination.

Assistant.-Professor Pritchard thought that the sums quoted by Mr. Broad rather represented the difference between the receipts and the expenditure than the actual loss. At the last Christmas examination there was a considerable difference between the amount received and the amount expended; but he could not see how there could have been any loss, because there were exactly twelve men for each night, and if they had not been examined last Christmas they would have had to come up the following May, and it would cost just as much to examine them then as at Christmas.

Mr. Broad said there were nine students examined, who paid, six of them, seven guineas each, and three of them three guineas, making a total of £53 11*s.*, while the expenses amounted to £80 17*s.*, showing a balance of loss of £27 6*s.*

Mr. Wilkinson said if the Christmas examinations were

abolished there would be a saving of fifteen guineas with regard to the practical examination.

Mr. Robinson said, taking all the examinations together, there must have been a considerable profit. Not more than fifteen years ago the College had not a shilling even to pay the examiners, whereas at present they had several hundred pounds invested in the 3 per cents., and over £100 at the bankers'.

Two letters on the subject were then read, (1) from Mr. Pritchard, (2) from Mr. Greaves.

Mr. Naylor said none of the existing literary institutions had more than one examination in the year, and he did not see what necessity there was for the Royal College of Veterinary Surgeons to have more. He thought it would be advisable to revise the bye-laws relating to this matter, and notice of the proposed change might be given that evening.

Mr. Wilkinson said the Board of Examiners had the power of rejecting a non-successful candidate for any period they chose to prescribe. It had formerly occasionally happened that a student who was rejected in April would claim to come up in December, though he had not attended the Royal Veterinary College until within a very short period of the examination. This, however, was not now permitted in the Royal Veterinary College. If the Council thought further time ought to be taken for the education of the pupil, no doubt a word to the Board of Examiners would give vitality to their power, and would lead them from time to time, if a candidate were rejected at several tables, to send him back for a year.

The President said this plan was already in practical operation in Scotland, as there was no interim examination, and this was a great reason why the whole subject should be properly considered, for he had more than once heard remarks, on the other side of the Tweed, about the apparent injustice done to the Scotch students.

Mr. Broad gave notice of the following motions for alteration of bye-laws to be suspended in the Boardroom:— (1) Instead of Bye-law 25, to read "The Court of Examiners shall meet but once in every year, namely, at the termination of the session of either school." (2) "In Bye-law 27," in place of "seven" in line 4, insert "ten; and in place of "seven guineas" in lines 8 and 13, insert "ten guineas."

This concluded the meeting.

CENTRAL VETERINARY MEDICAL SOCIETY.

The usual monthly meeting of this Society was held Thursday, January 4th ult., the President, George Fleming, Esq., in the chair.

Four new Fellows were unanimously elected, viz. Messrs. Cheeseman, Mosley, Lawrence, and East.

Mr. J. Woodger, jun., laid before the meeting a brain with two tumours each attached to the choroid plexus, which gave rise to a very interesting discussion: several similar cases were quoted by Messrs. Fleming, Wragg, and Clark.

Mr. Burrell introduced a syphon trochar, similar to those at the present time used in hospitals, and he advocated the use of it. The instrument has attached to it a flexible tube which serves to draw off the fluid without allowing the admission of air. The latter point was the subject of some discussion, several Fellows being of opinion that the admission of air was not so injurious as generally supposed.

The President next produced some navicular bones, which gave rise to a very lengthened discussion upon naviculararthritis and frog pressure.

Messrs. Cox, F. Mavor, and Burrell, considered that a great number of cases were due to rheumatic affections.

Joseph Woodger, jun.
James Rowe, jun.
Hon. Secs. pro tem.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

INFLAMMATORY FEVER, OR BLACK QUARTER.

By Mr. Henry Barnes.

Mr. President and Gentlemen.—I can scarcely reconcile myself to the position I now have the honour and privilege to occupy, because I well know and feel how utterly inadequate are my abilities for the duty before me. However, Gentlemen, rather than I should be found wanting, to further the interest of this Association, I ventured to undertake the duty of preparing this Paper, which I trust will be of sufficient interest to produce a hearty and friendly discussion. Although I feel cognisant of the fact that there are members here present to-night better able to treat the subject more practically and scientifically than I am, nevertheless my object has been to throw as much light (practi-

cally) on the subject, as to render it worthy of your special attention for the short time it will occupy in reading.

I must now ask you to proceed carefully with me to consider the disease we are met together this evening to investigate, viz.:

Inflammatory Fever, or Black Quarter.

This is without a doubt one of the most important diseases that can be offered for the consideration of our profession. It is a well known and very prevalent disease amongst our young stock, generally attacking those from six to eighteen months old, and is occasionally observed in aged cows; but these cases are very rare. It is variously known among agriculturists in different localities as "Black Leg, Black Quarter, Joint Felon, Quarter Ill, Quarter Evil, Blood Striking," &c., all of which denote the peculiar character of the disease which is usually characterised by lameness of one leg, followed by swelling and gangrene or mortification of the part affected.

Black Quarter must be regarded as essentially a disease of the blood, and may be defined to be "Congestive typhus accompanied with a local determination," the same disorganized blood exuding through the coats of the blood-vessels and becoming lodged in the cellular tissues in the neighbourhood of the congestion, whether subcutaneous, intermuscular, or internal. The vital fluid has become altered in quality, and too highly charged with the elements of nutrition. Hence, the balance, so to speak of the nutritive elements is destroyed, and the waste of the system does not progress in proportion to the supply of the nutritious materials. From this cause there is an abnormal accumulation of both the red corpuscles and fibrin of the blood, which becomes deteriorated in quality, and consequently unfit to carry on the purposes of life. This disease is considered by some authors to be of an inflammatory character, and thus giving it the name of inflammatory fever; but this is disproved of by its sudden onset and rapid progress, and especially by the absence of inflammatory appearances, which are only developed in those cases which survive for several days, and in which the extravasated blood, acting as a foreign body, excites inflammation in the living tissues with which it lies in contact.

All investigations that have been carefully conducted, point directly to the conclusion, that the blood of animals affected with this disease is deficient in the most important element, fibrin, therefore slow to coagulate—the red corpuscles being separated into integrant parts without undergoing any chemical action—this condition of the blood also occurs in cattle suffering under the disease known as Red or Black Water.

Causes of Black Quarter.

The predisposing causes of this disease are according to the proceeding views, anything that induced too rapid a growth in the young animal, such as rich and succulent food, the natural result

of an early spring, in which the grasses are forward and full of moisture,—this is proved by the best of the herd manufacturing, as they do, the largest quantity of rich stimulating blood, often fall first to its ravages; whilst others whose growth, after weaning, or from any other cause, has received a sudden check, and which are beginning again to thrive, are also prone to suffer from this disease —probably because the blood-vessels, not having recovered from the previous weakness in which they participated with the system at large, give way when subjected to the increased pressure of larger quantities of richer blood. Those who have directed their attention to the subject, have agreed that the principal proximate causes of Quarter Ill, are a deficiency of the fibrin and the otherwise vitiated state of the blood. Now, before proceeding any further with the causes of this disease, let us first of all consider the formation of the fibrin; and, secondly, the part fibrin performs in the animal economy.

Fibrin is found most abundantly in the blood and the more perfect portions of the lymph and chyle. It is very doubtful, however, whether fibrin, as such, exists in these fluids; that is to say whether, it is not itself formed at the moment of coagulation. Recently there has been some very interesting experiments made, to make it probable that the idea of fibrin existing in a liquid state in the blood is a mistaken notion of its real nature, and that probably it does not exist at all in solution as fibrin, but is formed at the moment of coagulation by the union of two substances which in the blood exist separately, and which Schmidt proposes to term fibrino-plastic and fibrinogenous. We are all aware that the food is the principal source from which compounds of the blood, and consequently all the various organs composing the body are abstracted. The digestive apparatus of ruminants is not very simple; their food consists of vegetable products, and chemical researches have shown that all such parts of vegetables as can give nourishment to animals contain certain constituents which are rich in nitrogen; and the most ordinary experience proves, that animals require for their support and nutrition less of these parts of plants in proportion as they abound in nitrogenous constituents. These important products of vegetables are especially abundant in the seeds of different kinds of grain and in the roots and juices of what we commonly call vegetables. This is generally styled the plastic element of nutrition, and composed of vegetable fibrin, albumen, and casein. Mulder says that these substances are found in all parts of plants—in the roots, stems, fruit, leaves, and sap, and form different compounds with sulphur and phosphorus, or with both. Thus the vegetable fibrin, albumen, and casein are the basis of the animal system, and enter into the various combinations therein produced. These considerations induced Mulder to give to the product of vegetable fibrin, albumen, and casein, the name of protein. The blood, or the constituents of blood are consequently compounds of this protein, with variable proportions of inorganic substances.

In addition to the above, however, we know that there is another class of substances required for the maintenance of life, viz. starch, sugar, gum, &c.; these are convertible in the animal system and are necessary for carrying on of respiration, but above all for the accumulation of fat, which is again convertible to other purposes, such as heat, &c.

Secondly.—The part fibrin performs on the animal economy. Fibrin exhibits more vital properties than any other fluid component of the blood,—so much so, that if separated from other constituents of the blood, it is capable alone of assuming the condition of an organized tissue. It was natural to suppose that this was the pabulum from which materials were drawn for the growth and development of the animal body; but from further demonstrations, both structural and chemical, it has been shown that fibrin is rather in a state of a fibro-gelatinous texture, than a fibro-albuminous class' because the fibrous network which is formed by its coagulation bears a stronger resemblance to the white fibrous tissue than any other texture of the body, whilst, chemically, fibrin differs from the albuminous class with its relationship to gelatine; the only difference being, according to Lehmann, that fibrin contains 1·5 more oxygen in every 100 parts than albumen does. Nearly all the changes produce by various agents in coagulated albumen may be repeated with coagulated fibrin, with no greater differences of result than may be reasonably ascribed to the differences in the mechanical properties of the two substances. The principals are that fibrin, immersed in acetic acid, swells up and becomes transparent, like gelatine, while albumen undergoes no such apparent change; and that deutoxyde of hydrogen is decomposed when in contact with coagulated fibrin, but not with albumen. Gelatine exists very largely in many classes of tissue, such as the skin, hoofs, cartilage, and the soft parts of bone. Most chemical physiologists have agreed that the substance forming gelatine, cannot, under any circumstance, be retransformed within the animal body into any kind of nutritious material, excepting to gelatinous tissues again. It is easy to understand, then, how the blood of young animals may become destitute of fibrin, for the gelatinous tissues in young animals form by far the largest proportion of the whole body, than they do in the adult animal; therefore a constant demand is made on the fibrin of the blood to meet the requirements of material, for the rapid growth of gelatineous tissues in the young animal. Whether fat or lean, then, the young are liable to be attacked with this disease; the daily food supplied to the animal in good condition, and thriving as well as one could wish, has been rich in material adapted for the production of fat, starch, oil, &c., but deficient in plastic or nitrogenous elements of nutrition. Whilst animals that are attacked in a low condition, their food as not only been deficient in quantity, but also in quality, being destitute of the elements of protein, and also those necessary to produce fat. Some exciting cause passes over the animal, and he becomes a victim of the disease.

Some breeds of cattle are more liable to this disease than others, especially those that are heavy-boned, clumsy looking animals, the gelatineous tissues having a greater demand on the fibrin of the blood, thus reducing it below the proper standard, and therefore predisposing the animal to disease of a typhoid character.

It also appears to be indigenous to certain farms, usually where the land is undrained and the herbage coarse, rough, and innutritive. It seldom appears on farms where drainage and better cultivation has improved the quality of the pasture.

Symptoms of Black Quarter.

They are often in the first stage very obscure, and thus much valuable time is lost before any effectual treatment is resorted to.

The first premonitory sympton usually noticed in this disease is a vague and listless expression of the face—eyes dull, ears hang heavy, and the animal if affected in one of its legs, limps on being made to move; and is generally found separated from the rest of the herd. These symptoms should be always viewed with suspicion, and a careful examination instituted.

The pulse will now be found to beat irregular; in some cases can hardly be felt, while in others, will be as high as 100 per minute; the mouth will be hot and clammy; visible mucous membranes congested, bowels torpid, urine scanty and very high coloured, rumination ceased, the animal disinclined to be moved, has a staggering gait and lame of the disease is located in the extremity, the effected part becomes enormously swollen, the limb almost incapable of motion, and dragged along the ground. Pressure being applied to the part in the early stages, produces pain and feels hot, which is afterwards succeeded with coldness; but if the animal diseased has existed for any length of time, there is a crepitating or crackling sound heard under the skin covering the part affected, which is due to the decomposition of the exudation. Although this disease is called black leg, it is not always confined to the limbs and other external parts, but occassionally we meet with it affecting internal organs; than many of the above symptoms are absent, and the case more difficult to diagnose. The animal will be found extremely weak, breathing accelerated, pulse increased, disinclined to turn round—if lying down, will not be made very easily to rise up—obstinate constipation of the bowels, legs and ears cold, mouth hot and clammy, and death quickly closes the scene. The duration of the disease is rarely more than a few hours; animals left healthy to all appearance, at night, and found dead the following morning, while others will linger on for twenty-four or even thirty-six hours, and now and then will take on a subacute character, and last for several days, when the swelling bursts and discharges a thin fœtid fluid, leaving very troublesome ulcerated sores, which are very difficult to heal up. But in these cases a good hope may be entertained of a recovery.

Post-mortem appearances.

Upon stripping the skin off the affected part, which is usually blown up like a bladder, the subcutaneous cellular tissues are found to be engorged with semi-coagulated blood, which, if cut into, gives exit to a large quantity of serum. The subjacent muscles are dark in colour and easily torn; there is a manifest want of the ordinary cohesive properties of the blood. In all the blood-vessels of the whole body, in both the arteries and veins, the blood is thin, black, and watery, having very little tendency to coagulate—does not even redden on exposure to atmospheric air—but passes rapidly into decomposition. The serous membranes, all over the body, are spotted with ecchymosis the heart will be found flabby and filled with black and partially coagulated blood. Frequently the intestines give evidence of the state of irritation during life, and usually spotted with ecchymosis. The lungs are gorged with black blood, and often there is found an effusion of a bloody character in the abdominal cavity.

The seat of the congestion, whether it be internal or external, presents the same appearance, and is distinguishable by the same physical characteristics.

Prevention of Quarter Ill.

There is an old, nevertheless a very true, saying, that prevention is always better than a cure. It is a well-known fact, to all here, that this adage is very applicable to this disease, because of its rapid progress,—in fact, so short is the interval from the first attack to the death of the animal, that the services of a professional man are very rarely attainable.

The administration of any specific to prevent black leg, further than reducing the animal, if in a plethoric state, by physicing and a moderation of diet, cannot be too much deprecated, as it can only lead to disappointment and loss on the part of the farmer, by inducing him to neglect other and more important measures. It is my opinion that there is more benefit derived from setoning in the dewlap, than any other remedy yet known. The principles of setoning may here be explained: it has been already pointed out that the proximate cause of this disease is a deficiency of fibrin in the blood, and it has been found by the experience of medical men, that if an inflammatory action can be set up in the system, even should it be circumscribed and local, the amount of fibrin in the blood is immediately increased.

Now, the quickest and best plan for raising and maintaining a local inflammatory action in cattle, and thus keeping up the proper amount of fibrin in the blood, is by inserting a seton in the dewlap; and to receive its full benefit the operation should be performed at an early period of life, say from four to six months old; and it is necessary that the action of the seton should be kept up by means of a little digestive, and drawn to and fro, about twice a

week during the first month; but the mere presence of the seton, acting as a foreign body, will serve to keep up a little irritation and slight suppuration, and so long as this is done, so long shall we have the inflammatory action. The seton, however, must not be expected to do away with the necessity for good management.

In the suceessful rearing of young healthy stock, a careful regulated diet is most essential; a small but regular allowance of linseed or oil-cake given daily from the time of weaning is a very great help. Good oil-cake ought to contain from 22 to 25 per cent. of fibrin-forming material.

Never at any time should they be allowed to fall back in condition, but without undue forcing they should be kept steadily thriving; they should also be allowed an open shed to run in, to protect them from stormy weather; and besides all this it is very essential to give them a change of pasture occasionally.

Every farmer ought to be acquainted with the nature of food necessary for the building up of the fine framework of young stock. They are very apt to be neglected during a severe winter; when the ground is covered with snow, they may, and may not, get their rumen, about half filled once a day with a very inferior quality of oat-straw, which in reality contains but very little real nourishment, and only a very small quantity of protein compounds; sometimes, however, we find oat-straw of a better quality, according to the nature of the soil, kind of grain, the variety of the season, and the condition when harvested. All these have their influence on the nutritive properties of the straw. The same may be said of turnips and other roots grown for cattle purposes.

It is highly essential that the food of young cattle should contain a good quantity of phosphates and bone earth, which are found in milk, barley, oats and wheat.

Again there are certain elements required for the production of muscles and gelatineous tissues; beans, peas, and good linseed contain these. The above articles of food may be grown of the very best quality and cheapest possible rate by the farmer himself, instead of being induced (as is often the case by seeing the flaming advertisements in our public newspapers) to purchase the so-called artificial food for the purpose of fattening our young stock, which in reality does not contain anything like the amount of nourishment found in what the farmer can supply for himself, at about one fourth part of the price asked by these vendors.

And now, Gentlemen, we have approached that division of our subject which is perhaps the most unsatisfactory, viz.:

The Treatment.

When the disease is thoroughly established or developed, treatment, in my opinion, is almost worse than useless. This fact is well known, not only to the members of our profession, but to the farmer himself, consequently our opinion is very rarely attainable.

The animal affected, to have any chance of a recovery, must be

very early observed, and this is not often the case, for the disease is very seldom recognised before lameness and swelling presents itself; and by this time the vital fluid has passed into a condition which no medicinal agent as yet known can directly restore. If the local determination be internal, or deeply seated amongst the muscles, in any joint, or about the spine, throat, or the head, then nothing effectual can be done. On the other hand, should its existence be early detected, and be localised externally, circumscribed in its action, having affected only the subcutaneous tissues —say about the shoulder, ribs, or the thick part of the hind quarters, then, I think it is possible for the disease to yield to rational treatment, which of course will vary according to the stage of the disease and condition of the animal. Supposing the patient to be in a plethoric state, and observed before the congestion has taken place, blood may be abstracted to as great an extent as the size and condition of the animal will allow. Small but repeated doses of saline medicine should be given every four or six hours, as the case may require, and continued until the bowels respond. At intervals of about two hours, stimulants should be given, the best being carbonate of ammonia. Mineral tonics will also be found of very great service.

The affected limb should be well fomented and rubbed with strong topical stimulants, such as equal parts of liq. ammonia, spt. turpentine and olive oil. Should there be any crepitation, the part may be freely lanced, in order to afford local relief, and afterwards dressed with Venice turpentine or strong digestive ointment, in order to produce a suppurative action.

It is highly essential that the strength of the animal should be kept up, by means of good linseed or oatmeal gruel.

I have now brought my task to a close, and beg to thank you for the attention you have so kindly paid me. In the discussion which will follow, I beg of you to bear in mind that the object of these associations is to convey to each other useful and practical information.

Veterinary Jurisprudence.

COURT OF COMMON PLEAS, WESTMINSTER.

December 4th, 1871.

(Before Mr. Justice Byles and a Common Jury.)

WARRANTY OF A HORSE.

BOTS IN THE STOMACH.

TURNHAM *v.* PARIS.

This was an action brought by the plaintiff, a licensed victualler at Islington, against the defendant, a horse dealer in Clerkenwell,

on the warranty of a mare which was purchased by the plaintiff of the defendant for the sum of £46, and which, after having been used for some two or three weeks, died suddenly, as it was alleged, from the accumulation of a large number of bots in the stomach.

Mr. Digby Seymour, Q.C., and Mr. Collins appeared as counsel for the plaintiff; Mr. O'Malley, Q.C., and Mr. Patchett conducted the defendant's case.

Mr. George Turnham, the plaintiff, examined. In the latter end of June last the defendant allowed me to have the mare in question on trial, which I thought was a good, serviceable animal; he asked £50 for her, and said that he would warrant her sound and a good worker. After I had had her a day or two she seemed very unwell, and went sluggish; she was attended by a veterinary surgeon, who was sent by the defendant, and she got better. In the latter end of July my man drove me down to the Welsh Harp at Hendon, and back, and on the following day she died suddenly. There was a *post-mortem* examination made of her.

Cross-examined.—On the first occasion of my taking the mare out my man drove me to Whetstone and back. She was a free, good goer; on the subsequent occasions she went very well. When first taken ill my man thought she had merely caught cold.

John Hicks, the plaintiff's groom, said, on the morning after he had driven his master to Hendon and back, on going into the stable early in the morning he found the mare very ill, and she died in a few hours. On the *post-mortem* examination a quantity of bots were found in the stomach: was not aware that all horses that had been out at grass, in the spring or summer season, were afflicted with bots.

Mr. Thomas Dollar, a veterinary surgeon of Bond Street, said he made a *post-mortem* examination of the mare on the 31st of July; he found two thirds of the cuticular coat of the stomach covered with bots; there was also inflammation of the bowels, which, in his opinion, had been caused by the indigested food passing into the intestines. The presence of the bots did not allow of the uniform action of the stomach on the food when it passed into the stomach. In his opinion that was the primary cause of death. The presence of bots would exhibit itself in the living animal by its having a rough, hollow coat, and a precarious appetite. Bots generally get into the stomach of a horse in the spring of the year when out at grass, and take some time to develope themselves. As a rule they are carried away in the dung, but in the case of an animal in bad health, whose stomach has been much injured by their presence, they remain, and in some instances destroy the coat of the stomach, which becomes indented from their constant pressure. Looking to the state of the mare when he made his examination, he should say she must have been in an unsound condition when sold to the plaintiff from the presence of an enormous number of bots in the stomach.

Cross-examined.—He was not a member of the London College; was a member of the Edinburgh College. The bots he found in the

stomach he did not remove; they remained to be seen by the gentleman employed by the defendant. They were found in the more insensible part of the stomach, and a few in the smaller intestines. The bot which is generated in the stomach, and that sometimes found in the anus, are a different class. The inflammation of the bowels, which he observed, was the proximate cause of the death of the mare, and that might have arisen from a chill, produced by standing some time in the cold after being driven hard, or having a pail of cold water given when she was heated. The presence of bots prevented digestion, just as the teeth of a human being covered with velvet would prevent his eating. In the time of his grandfather there was a notion prevalent that they assisted rather than impeded digestion, but that was now exploded. He never knew of an instance in which bots had been described as unsoundness. Bots are more commonly met with in horses turned out in low fenny countries than on hill-side pastures. The food passing into the stomach in an unprepared state acts as an irritant and sets up inflammatory action, which, in the course of twelve hours, might cause death.

Mr. Henry Kent and *Mr. Wilkinson* agreed in the opinion of the last witness, that the presence of bots in the stomach to the extent exhibited in the present case would be sufficient to cause severe injury to the mare, and ultimately to account for her death.

Mr. O'Malley, on behalf of the defendant, stated that his client had not warranted the mare; he had purchased her of a gentleman in Cambridgeshire, who had hunted her the previous season, and when sold to the plaintiff he said he believed her to be sound, but he would not warrant her. With regard to the notion entertained by Mr. Dollar and the other gentleman called by the plaintiff, that the presence of bots in the stomach of a horse was unsoundness, or that it tended to impair its general health, good appearance, and capability of working, he should call several gentlemen of very great experience in their profession who were of the contrary opinion, and who would state that the death of the mare was in no way attributable to the causes assigned by the witnesses for the plaintiff.

Mr. W. Paris, examined.—I bought the mare from a gentleman of the name of Waller for £42. I told the plaintiff that I believed her to be sound, but I did not warrant her. Some few days after the sale I heard she was unwell, and I sent Mr. Batt, the veterinary surgeon, to see her, and I was told he prescribed for her. I saw her afterwards some three or four times in harness, when she was in a great state of perspiration; she was a very free goer.

Cross-examined.—I have as many as twenty horses in my stables. When I sold her I had not the least hesitation in saying I believe her to be perfectly sound, but I would not warrant her. I am quite sure I did not do so.

Mr. Charles Waller.—I reside near Royston. I hunted the mare during the season of 1870, when she went very well, and was always in good health. When the season was over I turned her into a pad-

dock some two hours in the day for exercise. When I sold her to the defendant she was quite sound and well.

Mr. Hartley T. Batt.—I am a member of the Royal College of Veterinary Surgeons. On the 4th of July last, at the request of the defendant, I saw the mare. She was then suffering from influenza and pleurisy; it was a complicated case. Hicks, Mr. Turnham's groom, placed the case in my hands. I saw her again on the following day, when the symptoms had very much abated. I called again on the 7th, and she had so far recovered as not to require any further attention. Influenza was prevailing at the time, and was attributable to atmospheric causes. On the 31st of July I heard from Mr. Paris that the mare was dead, and I arrived shortly after the *post-mortem* examination had been made. I examined the stomach and intestines; the latter were in an acute state of inflammation, which undoubtedly was the cause of death. There was no inflammation of that part of the stomach where the bots were attached, which is the cuticular or insensible part, which is the place they are usually found. There was nothing to show any injury from the bots; there were slight indentations where they had been, which is always found in such cases. There was no connexion between the presence of the bots and the inflammation of the bowels. I do not agree with the theory that the presence of the bots prevents the food passing into the intestines in a perfectly digested state; I never heard of it before. Inflammation of the bowels might arise from various causes, such as being overdriven, and left to stand in cold places, producing chill, or drinking cold water when in a state of heat, which are matters of daily occurrence. I never saw a case of inflammation of the bowels arising from the presence of bots in the stomach. I have heard of a case where bots had perforated the stomach, and the food passed into the abdominal cavity, and produced inflammation of the outside lining of the bowels and stomach. There are one or two such cases recorded. Unwholesome food, or undigested food passing into the stomach would produce inflammation. A horse eating bad hay, or kiln-dried oats, would be liable to such inflammation, which is sometimes very rapid in its progress. I never before knew that bots were considered a disease; they are commonly found in horses that are turned out to grass during certain months. Their existence causes no disparagement in the outward appearance of the horse, and there is nothing to show of their existence.

Cross-examined.—The existence of pleurisy would show itself in three or four days by the horse breathing quickly, and having, in some cases, a rough coat. After the *post-mortem* examination, I took the morbid parts to Professor Spooner, who has since died, and his opinion coincided with mine. The statement by Mr. Dollar that there were as many bots as would fill a quart is, I think, an exaggeration. I counted about sixty—there was evidence of a number having passed away. The presence of even a large number of bots would not interfere with digestion. I have seen as many as 600 in one cluster partly on the sensible as well as the insensible part of

the stomach. I do not admit that bots are an irritating cause. A horse having influenza and pleurisy, on the 4th of July, would be more liable to inflammation of the bowels from his system being in a bad state. I do not agree in the opinion expressed by an eminent French authority on veterinary science that "bots in a multitude may occasion sharp pains, and prove detrimental to digestion by absorbing the juices necessary for that operation." I agree in what is said by the same writer, "that so long as they exist in small numbers they do no harm, and cause no pain." neither do they, I think, in large numbers. My treatment, when I was called in on the first occasion, had removed the mischief; the mare died from acute inflammation of the bowels.

Mr. O'Malley.—My friend has referred to the French writer on this subject; do you agree in this: "That the perfect health horses enjoy with bots is proof sufficient of their innocuous nature and harmlessness in a general way?"

Mr. Hartley T. Batt.—I do. It is a generally received opinion in our profession that they are supposed to feed on the mucus thrown out by the membrane of the stomach—not on the coats of the stomach.

Assistant-Professor Pritchard, examined by Mr. O'Malley.—I examined the stomach and bowels of this mare the day after they had been examined by Mr. Batt. I found the whole course of the lining membrane of the bowels in an inflamed state, and noticed on the cuticular portion of the stomach a number of bots, and a number of depressions indicating that bots had been attached there and become removed; the stomach was perfectly healthy. There was no connection between the state of the bowels and the presence of bots. Their presence had nothing to do with the inflammation of the bowels, nor is their existence considered a disease; on the contrary, it is consistent with the most perfect health of the animal. I never before heard of their producing inflammation in the bowels by preventing the proper digestion of the food, and I think such a theory is absurd. In this instance I do not suppose that there were more than sixty or seventy. I have known scores of cases where there were double the number present. I have never heard of an attack of pleurisy lasting many days without the symptoms being very palpable. The presence of bots does not impair the energy or the health of the horse; I am not aware of any symptoms by which they can be detected.

Cross-examined.—In a healthy horse the period of the development of the bot is about ten months. I do not believe that a horse when in an unsound or weak state is more likely to attract the gad fly than a sound healthy animal; it is a well-known fact in veterinary service. I have known numerous cases of bots in the stomach, but I have never known, in my own practice, an instance where they have in any way interfered with the health of the horse. Impaired digestion is not in itself a cause of inflammation of the bowels. The digestive process is not completed in the stomach; the food partly digested there becomes wholly digested in the intes-

tinal canal, where there are juices necessary to its digestion; the bot does not feed on them, but on the mucus. I think the statement of the French writer referred to, that "bots in a multitude occasion sharp pains and prove detrimental to digestion by absorbing the greater part of the juices necessary for that operation" to be absurd, and in my opinion the author of such statement could know nothing about digestion. I do not think the mare in question had been suffering from inflammation of the bowels more than twenty-four hours. I see no link at all between the first and the second attack; in the one case the mare had an attack of influenza, from which she recovered; in the second instance she had inflammation of the bowels, from which she died.

Mr. J. Rolfe Cox, M.R.C.V.S., Mount Street, Grosvenor Square; *Mr. Talbot*, M.R.C.V.S., of Scotland Yard; and *Mr. George Williams*, M.R.C.V.S., Wilton Road, Pimlico, corroborated the evidence of the preceding witnesses.

Mr. O'Malley was about to address the jury in summing up the evidence for the defendant, when one of the jury said, My lord, we do not think it necessary to trouble the learned counsel, we have quite made up our mind.

Mr. Justice Byles.—The learned counsel for the plaintiff may claim to address you to see if he cannot change your opinion.

Mr. Digby Seymour.—When the jury have intimated an unanimous opinion, I feel bound to bow to their decision.

Foreman of the Jury.—We are all agreed.

Mr. Justice Byles.—That being so, I think I may relieve you from all responsibility, Mr. Seymour, by saying that I entirely agree with the jury. You think the horse was not unsound?

Foreman.—Certainly, my lord.

Mr. Justice Byles.—So do I, gentlemen.

Verdict for the defendant.

SHEFFIELD TOWN HALL.

Selling Glandered Horses.

Henry Hall, file grinder and greengrocer, of Silver Street, was summoned by Mr. Jackson, veterinary inspector for the borough, for unlawfully taking a glandered horse through a public thoroughfare.

After the law relating to the case had been briefly explained by the Town Clerk (Mr. Yeomans), who appeared in support of the information, Charles Rowbotham, carter, of Furnace Hill, was called.

He said that on the 30th of December the defendant brought a black horse to his house and asked him to purchase it. The animal

was trotted up and down the street, and believing it to be sound, he bought it for £3 15*s*. On the way to the stable the horse coughed, and subsequently he discovered a running at the nose. He immediately went in search of the defendant, but was unable to find him. Witness afterwards took the horse to Mr. Thompson, veterinary surgeon, who, on examination, pronounced it to be suffering from glanders.

Mr. Thompson and *Mr. Jackson*, veterinary surgeons, spoke to the horse being in the condition described when it was sold by the defendant. Since then it had been destroyed at the establishment of Mr. John Young, in Pond Street.

Mr. Roberts, who appeared for the defence, contended that his client was unaware that the horse was affected with the disease.

Before the case was decided, a similar information against *Mr. William Henry Haigh*, omnibus proprietor, Ecclesall Road, was heard.

The evidence showed that on the 30th ult., a man, named Oliver, living in the Park, went to Mr. Haigh's premises, and had some conversation with him in reference to some horses which he (Mr. Haigh) had for sale. There were three horses in one stable, and defendant asked £15 for them. Eventually Oliver fetched Mr. Hall, the defendant in the previous case, who purchased the horses for £10. One of the horses was the animal purchased by Rowbotham for £3 15*s*. The other two were also found to be suffering from glanders, and were killed by order of Mr. Jackson.

Mr. Fernell submitted that there was no case against Mr. Haigh, inasmuch as the ownership of the horses was entirely taken from him when he received payment for them from the man Hall, and therefore he was not liable for what took place afterwards. Apart from that, he assured the Court that Mr. Haigh was ignorant that the animals were affected by the glanders, or he would have had them removed from his premises long before. Two of the horses, he said, were sold on the understanding that they went direct to the knacker's yard.

The Stipendiary considered the cases clearly proved, and ordered each of the defendants to pay a fine of £10 and costs, or, in default of payment, to be committed to the House of Correction for three months.—*Sheffield Daily Telegraph*, January 10th, 1872.

MATRICULATION EXAMINATION.

At recent meetings of the Committee of the College of Preceptors, for conducting the Matriculation Examination, instituted by the Governors of the Royal Veterinary College, ten candidates for admission as students presented themselves, seven of whom passed, and three were rejected.

The successful candidates were:—

Mr. W. R. Bryan	Loughborough.
— S. Cooper	Plumstead.
— J. Dibben	Derby.
— J. Middleton	Holloway.
— J. E. Nurse	Lynn.
— A. Pritchard	Kensington.
— G. Wilkins	London.

MISCELLANEA.

ABOLITION OF SLAUGHTER HOUSES, &c.

It is satisfactory, says the *Echo*, to know that by the gradual but sure process of efflux of time, London will soon be free from many of the most unwholesome of her manufactories. In the Metropolitan Building Act of 1844 is a provision that after the expiration of thirty years from that date, no blood-boiler, bone-boiler, fell-monger, soap-boiler, *slaughterer of cattle, sheep, or horses*, tallow-melter, tripe-boiler, or similar dealer in nastiness shall be allowed to carry on his trade within fifty feet of any dwelling-house, or forty feet from any public way. The provision is an excellent one as far as it goes, and it is only a pity that the distance was not made ten times as great, that is to say, somewhat coextensive with the nuisance. But as it stands it will necessitate the removal of nearly all these establishments now at work in the metropolis, and so in the year of grace 1874 we may fairly hope that time and the Building Act will do something to purify our atmosphere.

OBITUARY.

We regret having to record the death of Mr. John Tombs, M.R.C.V.S., Great Barrington, in the sixty-sixth year of his age. Mr. Tombs, after obtaining his diploma in 1829, spent some years in India, and, like many others, suffered so much from the climate, that he was compelled to return to this country for the benefit of his health. He was much respected, and has died deeply regretted by a large circle of relatives and friends.

ERRATUM.

Page 8, line 24, *for* "substances," *read* mineral substances.

THE

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Communications and Cases.

OBSERVATIONS ON THE ANATOMY AND PHYSIOLOGY OF THE HORSE'S FOOT.

By George Fleming, M.R.C.V.S., Royal Engineers.

Physiology of the Horse's Foot.

(*Continued from* p. 96.)

Fourth Experiment.—A colt, two and a half years old, was neurotomised on the 1st September, 1852, in the right fore leg. Sensibility was extinguished for two months, then it returned at some points. This animal was sacrificed eight months after the operation. At the autopsy the microscope demonstrated the regeneration of some of the nerve fibres. The measurements of the hoof were made regularly during three months, and yielded the following results:

Part of the Hoof.	Healthy Foot.				Neurotomised Foot.				
	1st Sept.	29th Sept.	3rd Nov.	20th Nov.	1st Sept.	29th Sept.	3rd Nov.	20th Nov.	
Anterior part	30	36½	44	46½	38	46	56	59	
External part	21	29¼	38½	41½	16½	27¼	39½	43	
Internal part	25½	32¾	42	44½	21	30¼	40	42	
The rate of growth is then:									
				Total.					Total
Anterior part	...	6½	7½	2½	16½	8	10	3	21
External part	...	8¼	9¼	3	20½	10¾	12¼	3½	26½
Internal part	...	7¼	9¼	2½	19	9½	9¾	2	21
Totals	...	22	26	8 millim.		28¼	32	8½ millim.	

In explanation of the notable diminution in the growth from the 3rd to the 20th of November, the regeneration of the primitive nerve-tubes cannot be invoked, as this diminution was also observed in the healthy foot.

The identity in many respects between the horn and hair induced Grohn to make experiments to ascertain what influence the nerves exercise on the growth of the latter. On the two experimental horses—two and four—the hair was shaved off on the healthy and neurotomised limbs to a certain extent above the coronet, and in such a manner that the part shaved was soft and smooth to the touch, and perfectly supple. On the second horse this shaving was performed sixteen days after the neurotomy; on the fourth, only four days subsequently to the operation. In these two horses there was no subsequent recovery of sensation.

Two days after the hair had been cut, it had already grown so fast on the neurotomised limbs that it could be seen and felt. There was nothing of this on the healthy legs until the fourth day, when the hair on them was about the same length it was on the others on the second day; while the hair on these latter had grown a millimètre in length.

It was remarked, that the difference in growth was greater in the second than the fourth horse.

According to these experiments, it would appear that the horn grows all the faster on feet in which the loss of sensation is complete, and that as soon as this is more or less re-established, the growth diminishes. Grohn adds, that after the removal of a portion of the wall, its regeneration is all the more rapid in proportion to the number of nervous filaments cut or destroyed.

In the fourth experiment it was also remarked that, if from the 3rd to the 20th of November, the inner part of the hoof belonging to the neurotomised limb had only grown two millimètres, while the same part of the healthy foot had increased two and a half millimètres, this was owing to the recovery of a somewhat large degree of sensation at this date in the neurotomised foot.

The growth of the horn in length in the neurotomised foot had no influence on the thickness of the wall, as when measured it was found to be the same in both feet.

From all this it might be concluded, that the growth of the horn and hair does not require nervous influence; for if it did, the increase in the hoofs of the neurotomised feet would not have taken place; their length must have remained sta-

tionary, and they would therefore have been less in size than the healthy feet after a certain time.

It follows from these considerations, that the increase of the horn and hair is regulated by nervous influence; and that when, after neurotomy, sensation is still maintained by nervous filaments, or the divided nerves are united by adventitious tissue, this growth becomes diminished, though regular. And yet the nervous continuation with the skin cannot be invoked, for how did it happen that the shaved hairs grew more rapidly on one foot than the other? How was it that with the third horse, in which the continuance of sensation at the coronet was remarked after the operation, the growth of the hair was effected much more rapidly than before the experiment?

The conclusions at which Brauell arrived were as follows:

1. That in feet not deprived of sensation, the growth is greater at the sides than at the anterior part, for in the first experiment this only increased $2\frac{1}{2}$ and the sides 3: in the second experiment 15, the inner side $16\frac{1}{2}$, and outer side $17\frac{1}{2}$; while in the fourth experiment the anterior portion grew $16\frac{1}{2}$, the inner 19, and the outer $20\frac{1}{2}$.

2. That the outer side grows more than the inner.

3. That after the arrest of nervous influence, the relations were—

1st Expt.—Anterior part	$3\frac{1}{2}$;	outer side	$4\frac{1}{2}$;	inner side	4.		
2nd do. —	do.	$21\frac{1}{2}$;	do.	$19\frac{3}{4}$;	do.	$24\frac{1}{2}$.	
4th do. —	do.	21;	do.	26;	do.	21.	

It is to be remarked that the growth in the second and fourth experiments was not very regular; that the increase of the inner side was diminished in the first and third, and augmented in the second, and that there was an arrest of growth in tho anterior and inner portions in the fourth experiment.

Grohn also took exact note of the temperature of the healthy and neurotomised feet, as well as the external air, and that of the stable, &c., and concludes these observations by saying:

1. The temperature of the skin in the posterior part of the foot is more elevated by from 3°, 5°, and 8°, than in front of the coronet, whether or not the limb has been neurotomised.

2. That the temperature of the skin in certain points is higher at times than elsewhere, and that these variations are not insignificant.

3. That the variations are greater and more frequent,

comparatively, in the neurotomised feet of the animals experimented upon.

4. That the variations do not depend upon the period of the day, the temperature of the stable, nor upon the taking of food.

5. That the temperature of the skin at the coronet of the neurotomised feet exceeds by some degrees that of the healthy feet tested at the same part.

There may be other general influences at work which operate in bringing about changes in the amount or character of the horn; but these are as yet so obscure or undefined, that we cannot touch upon them here. One among them, however, might be indicated as worthy of attention, from its extensive prevalence in this and other countries; I allude to the emasculation of horses. Nothing, so far as I am aware, has been noted of the effects of this operation on the secretion of horn in this animal; though, judging from its results in other creatures, it can scarcely be doubted that it must engender some modification.* For instance, if a fallow-buck, with antlers, be castrated, they are shed earlier than usual, and by a more active absorbent process, which leaves an irregular concavity at the base: the antlers that are subsequently developed are small, seldom branched, retain the "velvet" longer than usual, and become thickened by irregular tuberculate masses of bone. If a young buck be castrated before it has "put up" antlers, it does afterwards in some instances develop them; but of reduced size and abnormal shape, retaining

* In an ancient Arabic treatise on the Horse and its Diseases, entitled 'Le Nâcéri,' and admirably translated by M. Perron (Paris, 1860), it is reported that Hizâm presented a splendid horse to the Caliph El-Moutewakkal (who was assassinated in the year 247 of the Hegira = A.D. 861). This horse had thin, weak hoofs. "My dear Hizâm," says the Caliph, "I would like this horse very much if it had good hoofs." Hizâm took away the animal, called in a veterinary surgeon, and desired him to throw the animal on the ground and castrate it. The operation was performed, and the horse was carefully attended for four months until it was completely cured, and in excellent health and superb condition. After this it was again presented to El-Moutewakkal. The hoofs were in a perfect state as to shape and quality. "Allah!" exclaimed the Caliph; "inform me, Hizâm, by what means thou hast restored the hoofs of this horse." "Prince of Believers," replied Hizâm, "that which thou didst say to me suggested an idea. I had remarked that the young Roumaniote stallions and others in the stables of the Prince of Believers had their hoofs small and light, and that the castrated horses had, on the contrary, large strong hoofs, although they were all descended from the same stock. I inferred from this that the difference in the latter was due to their being emasculated, and I therefore had this horse operated upon. Consequently its hoofs are now excellent." The Caliph was profuse in his felicitations, and gave Hizâm a valuable present.—Vol. iii, p. 240.

them, with their formative covering, longer than usual. Occasionally, though rarely, they are shed and renewed; but such shed antlers of a "heavier" or castrated deer are characterised by the excavation of their base. The normally shed antlers of perfect males have the base flat or convex, and almost smooth.* In Lapland, the skin of an uncastrated male reindeer is worth two of the skins of reindeer that have undergone this operation.†

And it has been recently noted that emasculated fowls do not moult.

Beside the above-mentioned general influences that either directly or indirectly modify the corneous secretion, there are yet others which, though much more limited in their action, produce analogous effects either on a single foot or on certain circumscribed regions. Any irritant, such as a blister, will cause a more rapid descent of the hoof if applied around the coronet: a descent marked also by a thicker circle of new horn than is observed in ordinary conditions. This is so well known that it is frequently resorted to when it is deemed necessary to modify the dimensions, form, or quality of the hoof. And this effect may be produced by the action of an irritant on any part of the organ; even the presence of disease at a limited point will induce a hypersecretion: as when the coronary cushion is in an inflamed or congested state towards the lateral cartilages, in consequence of abnormal changes taking place in these; then we perceive well-defined circles growing down from the upper border of the wall at the corresponding quarters. Following this indication, when the wall has become injured or defective at any part of its circumference, the veterinary surgeon produces a similar result by applying a stimulant to the coronet, and thus expedites the formation of new horn to repair the damage or defect. Accidental causes, such as bruises, violent pressure, burns, punctures, &c., which determine a general or partial influx of blood to the horn-producing apparatus, no matter how transitory their immediate action may be, yet leave their traces on the exterior or interior of the horny box in the form of rings, Keraceles,‡ Keraphylloceles,§ or intra-corneous sanguine suffusion.

* Owen, 'Comparative Anatomy and Physiology of Vertebrates,' vol. iii, p. 631.

† Clark, 'Travels in Various Countries of Scandinavia,' vol. i, p. 408.

‡ Keracele (κέρας, horn; κηλη, tumour), the name given by the distinguished French Veterinary Professor, Vatel, to a horny tumour on the external face of the hoof.

§ Keraphyllocele (κέρας, horn; φύλλον, leaf; κηλη, tumour), the desig-

From these observations, it will be readily understood that there are many general or local influences which may intervene to bring about a more or less permanent modification in the keratogenous function,—the result of a disturbance in the circulation of blood through the tissues in which that function is located; and knowing this, the scientific practitioner can often, with great benefit, exercise his judgment in accelerating or retarding the flow of blood generally or partially in these tissues, according to the special indications present.

The precise rate at which the wall of the hoof grows cannot be stated, owing, as pointed out, to the variation observed not only among horses of the same or diverse races, but even in the same animal at different times.

From measurements instituted three years ago among troop horses,—draught and saddle,—I find that black hoofs grow quicker, when healthy, than white ones. The rate of growth for the front hoof was greater than that for the hind one; in the former it ranged from 4-10ths to 8-10ths of an inch in five weeks, while in the latter it varied from 3-10ths to 7-10ths in the same period. After the application of a blister around the coronet of a fore foot, in eight months nine rings or circles were apparent on the wall; the first ring that appeared was 3-8ths of an inch in breadth in front, the others only 1-4th inch.

We have now arrived at the termination of the series of papers on the horse's foot, which, for so many months, have occupied a considerable portion of the pages of the *Veterinarian*. The author of these papers has often been moved by a sentiment of apprehension, lest the desire to awaken an interest in the subject—like that which made it an object of special predilection for him—should carry his observations beyond the bounds of utility and patience. Nothing but the irresistible fascination that appears to seize every one who attempts to study this wonderful region of the horse's body, can be urged as a plea for long descriptions and minuteness of detail—which may have been wearisome to many—and the attempt to add to the knowledge already possessed,—which may be looked upon as useless by others,—of the anatomy and physiology of the foot. The apparently interminable story has come to a conclusion, so far as our professional Journal is concerned; though the subject is so far from being exhausted that, should circumstances permit, it is possible that these

nation bestowed by the same authority on a horny tumour on the inner face of the hoof in connection with the laminæ.

observations may be printed in a collected form: the physiology of the organ being completed, and its pathology considered from a point of view in harmony with its structure and functions.

RABIES IN THE HORSE.

By A. J. Murray, M.R.C.V.S., Detroit, Michigan, United States.

On the forenoon of Sunday, 24th December last, I was called on by the manager of the American Express Company's stables, in this city, to examine a dark chestnut horse. On reaching the stable I found the horse in a box-stall. The door of the stable was divided into two parts, the lower half being shut, and the upper one open. I observed the horse to be very irritable, as he would snap at any one coming near the door. He frothed slightly at the mouth, occasionally ground his teeth, his ears were constantly moving backwards and forwards, and there was constant twitching of the muscles of the shoulder; his eye also had a very wild expression. When he was spoken to, or when any noise was made, he became irritable, snapping to the right or left, and moving restlessly about his stall. By my advice the lower part of the door was strengthened by having strong boards nailed across, so as to prevent his getting out if he became violent. I was told that he had not eaten anything that day: but while I was there the stable manager offered him a little hay, which he took; and he also drank some water.

I called again in the afternoon. The horse's irritability seems to have increased.

December 25th.—The horse appears to be perfectly ferocious, rushing towards any one who goes near the door. I held the handle of a broom towards him, and he seized it savagely with his teeth. I had held it out to him on the previous day, but he did not touch it.

Called again between five and six o'clock in the evening of this day. Horse very restless, lying down and getting up frequently. He was so savage that the upper part of door was kept shut and secured, as it was feared that some of those who were curious to see him might be bitten.

Some persons of an experimental turn of mind had proposed to give the animal chloroform, and a half-drunken ostler, who had come to see the case, resolved to carry out the

idea, and having procured a bottle of chloroform, he went up to the door, and held out the bottle towards the horse's nose. In an instant the horse snapped the bottle out of his hand, and then made a snap at his arm. Fortunately he only caught the man by the sleeve of his coat, and one of the by-standers instantly dragged him away before the animal could make another snap; otherwise he might have been seriously hurt.

At this stage the horse bit everything which presented a surface on which he could fasten his teeth. When he came to the door he seized the upper edge of it with his teeth, and in his fury bit his legs and other parts of his body. During these paroxysms the peculiar curling of his lips and nostrils gave him an indescribably ferocious appearance.

On calling next morning I was told that he had died during the night, and been removed at an early hour in the morning.

This horse was bitten on the 25th November, while being driven along the street. The dog which inflicted the bite rushed at him and seized him by the lip. The horse shook him off, and the dog immediately darted at another horse which was passing, and seized him in a similar way. On being again shaken off he ran along the street, turned the first corner, and was not seen afterwards. The driver of the horse told me that, for a fortnight before I was called in, the animal did not appear to have so much spirit as usual. On Thursday, 21st December, he began to go off his feed; but worked up to Saturday, the 23rd (the day before I was called in), though on that day he appeared unusually irritable and fractious. The wound in the lip was not troublesome in healing, and so far as I could observe it did not appear to be in an inflamed state when I was called on to examine the animal.

Connected with rabies in animals I send you as an *addendum* to the above account the following extracts from the *Detroit Free Press*, of January 11th and 12th, 1872:

"A Mad Dog travelling through Springwells.—Two Persons and several Animals bitten.

"Just before noon yesterday, as a woman named Mrs. Charles Desens, living in the township of Springwells, near the brickyard of John Greusel and Sons, on the Chicago Road, was in the yard after an armful of wood, she saw a large brown dog approaching. The animal was rushing straight

toward her, and she saw that he was apparently suffering with hydrophobia, his jaws snapping together every moment and his mouth being covered with a greenish froth. She screamed and ran for the house, but had not taken ten steps when the mad brute seized her by the thigh and threw her down. Two or three persons who witnessed the attack shouted and ran toward the dog, when, tearing once or twice at the woman's clothing, he ran off down the road. As there was no doubt of the dog's madness, the woman was brought into the city to a surgeon as speedily as possible, and had the wound attended to. The teeth of the brute made a wound nearly four inches long and quite deep.

"Passing along a few rods below Desens', the dog ran into a yard and seized and threw down a hog belonging to a man named Crimmins, and chased a boy so closely that the lad had barely time to get into the house before the dog jumped against the door. He then ran round to a window and was for three or four minutes seemingly determined to jump through the sash, but finally went away.

"Leaving the road, the dog ran down the road until coming to a cow, which he flew at and bit severely several times. At this time several men were in chase, and two or three shots were fired at the dog, but he paid not the least attention. The men were afraid to follow him too closely, and made pursuit in the fields to have the fences as a protection.

"After leaving the vicinity of the brickyard the dog encountered no one until coming up with a Miss Susan Martin, a teacher in the Springwells school. She heard the shouts of the men, saw the dog, and ran to the side of the road to avoid him. But the dog rushed at her, jumped for her throat, and pushed her down, fastening his teeth in her shawl only. He made one or two snaps at her arm and face, but finally ran off down the road, which was full of children going home to dinner. The escape of the teacher was almost miraculous, the brute leaving froth on her clothing and dragging her shawl clean off. More men here joined in the pursuit, and by shouting to the children the road was soon cleared, the beast travelling very slowly, and several times halting and turning, as if to attack his pursuers.

"At length, striking a rapid pace, the brute passed half a mile further west, and came upon a boy named John Preston, only son of a Springwells farmer of that name. The lad, who is about twelve years old, was sliding on the ice at the side of the road, and upon seeing that the dog was going to attack him, became frightened and confused, and did not attempt to escape. The dog seized him

by the wrist, threw him down, and was biting him savagely, when a farmer named Frank Shover, coming in with a load of wood, reached the spot, and, although seeing that the dog was mad, he leaped down and pounded the brute until he let go his hold. The animal let go only to make a dash at Shover, but was knocked down with the whip, and then got up and run off, still going west. When last heard from he had passed the Six-mile House, biting two more hogs, and had taken to the fields.

"The boy was at once hurried home, and he was also brought into the city and had his wound dressed by a surgeon. Such an excitement as was raised by the passage of the dog along the road was not equalled by the Miller murder, and people coming in were full of the news. The hogs bitten, as well as the cow, were killed by their owners shortly after, and it is hoped that the remedies which the surgeons have adopted may prevent any serious results to the woman and lad."

"*12th January*, 1872.

"*Another Boy and a Horse bitten.—The Dog killed.—A long Chase.*

"In regard to the painful excitement about the raid of the mad dog in Springwells Wednesday afternoon, an account of which was published yesterday, it has been ascertained that the animal bit a boy and created considerable commotion before leaving the city. The brute was first heard of Tuesday afternoon, when he appeared on Porter Street, and bit a boy named Kanane, whose parents reside on that street, near Seventh, in the leg, inflicting a very painful wound. The dog at this time did not exhibit any marked signs of hydrophobia, except that he snapped at everything, and was unusually ferocious.

"The boy Kanane ran up on Michigan Avenue, following the dog until meeting with Officer McDonald. The dog had then run into the yard of Jacob Stasser, at the corner of Twelfth and Michigan Avenue, a butcher, better known as "Butcher Jake." Here the brute passed round the rear of the house to a pair of stairs, which he ran up, and drove the family out of doors or into other rooms, and then took refuge in a bedroom. McDonald did not know that the dog was mad, and opened the door to shoot him. Learning that some children had shut themselves up in the room below, and fearing that the ball would go through the floor and do them injury, he put up his revolver, picked up a chair,

and went and drove the dog out of the room and down stairs, knocking him down once as the animal sprang for his breast. The dog took refuge under the adjoining frame house, also belonging to Stasser, a very dark place, and the officer shot at him twice, one report of his revolver being followed by a howl, as if a wound had been inflicted. The officer then got a long iron hook, and tried to draw the dog out, but could not succeed. The animal growled in a savage manner, and bit the hook several times. Not believing the dog dangerous, and hoping the wound would prove mortal, McDonald nailed up the orifice by which he had crawled in, and left the animal to die.

"It seems that towards evening some one tore off one of the boards, and that some time during the night the dog got out; at least he was found in Stasser's yard again on Wednesday morning, and Officer Graham was called upon to shoot him. Not having his revolver, he borrowed a small one, and, finding the dog at the head of the back stairs again, gave him a bullet. He saw blood on the dog's breast, and knew that the bullet had struck him. The brute rolled down the steps, and ran round to the slaughter-house, and here was shot again. A crowd had by this time collected round, and the dog became alarmed and left his hiding-place, making a bite at Graham, and getting another of the little "pill" bullets in his side. He then ran off down the avenue, pursued by a crowd, and inflicted the damage published yesterday.

"After being beaten away from the boy Preston by Frank Shover, the dog ran through the fields until, entering the yard of James McGoldrich, half a mile off the Chicago Road. north side, where he nipped at McGoldrich's horse. Crossing over to Mr. Carter's yard, the dog sprang upon and bit Carter's horse in the nose. After this he crossed to Wagner's premises, and Wagner, arming himself with a well-pole, went at the dog and chased him away. The brute leaped the fence, and finally came upon the farm of William McDonald, in Greenfield, near the Springwells line, and was here killed by the farmer, who brought him down at the third shot from his revolver.

"An hour before, Deputy-Sheriff Larkins, one of the pursuers of the dog, mounted a horse and rode down the road, warning every one that the mad brute was travelling around, and in this way put every one upon his guard. The boy Kanane had his bite attended to yesterday, and Carter's horse was killed soon after being bitten. The affair has produced much excitement in the city, and a number of dog-

owners were yesterday killing off their curs. There is a general demand that the police shall commence a raid upon the canines, which shall not end while a dog is suffered to go at large in the city or surrounding country."

[These extracts from the *Detroit Free Press* are so characteristic of the sensational style of writing which our transatlantic cousins indulge in, that we have not hesitated to give them *in extenso*.—EDS.]

REPORT OF AN OUTBREAK OF SPLENIC APOPLEXY IN A DAIRY OF MILCH COWS (the property of Mr. CLARE, Hampson Farm, Bolton, Lancashire).

By ALFRED CHALLINOR, M.R.C.V.S., Bolton.

THE particulars of this outbreak of that singular disease known as splenic apoplexy are briefly these. On Saturday, January 6th, the herdsman, on making his usual nightly round at eight o'clock, found all the animals apparently healthy, but on his again visiting the sheds at half past five the next morning one of the cows was found dead and lying near to a pool of blood of from two to three gallons in amount, which had evidently come from the rectum.

I was at once sent for, but before my arrival another cow had died quite as suddenly, she having also parted with a quantity of blood from the bowels when in *articulo mortis*.

On making a *post-mortem* examination I found the lungs, liver, and especially the small intestines highly congested, the latter containing much "spoilt blood" of a deep purple or black colour. The spleen was also very much distended with blood of the same kind, being four or five times its normal size. The mesenteric glands were in a similar condition. The stomach contained a fair quantity of food, and did not present any unusual appearance.

The affected viscera were forwarded to Professor Simonds for his examination, and opinion of the nature of the disease. This he kindly gave, having come to the conclusion that the animals had died from well-marked attacks of splenic apoplexy.

The food on which the cows had been kept consisted of hay-chaff, bran, linseed, linseed-cake, palm nut-cake, "malt-combings," and bean-flour, with a fair allowance of hay. Rather a strong diet, even for cows yielding a full flow of milk.

I at once ordered a dose of aperient medicine for each of the remaining animals (twenty-eight in number), and gave

directions for the food to be immediately changed. This was done, and the animals placed on bran mashes, turnips and carrots. On the recommendation of Professor Simonds I also gave them the hyposulphite of soda in two-ounce doses daily. Notwithstanding these precautionary measures three more of the cows died during the following week. I now managed to get them removed from the place, and since then there has not been a fresh case.

I may add to this short account a very important fact, viz., that during the *post-mortem* examination, one of the men accidentally cut himself, and has since been dangerously ill, doubtless depending on this cause. A cat, also, which partook of some of the flesh of one of the diseased animals, died suddenly very shortly afterwards.

I am aware that this unexpected occurrence of splenic apoplexy does not essentially differ from many others, but it is the first, so far as I know, which has taken place in this part of Lancashire, and hence the greater reason why it should be recorded. Besides this, we can only hope to obtain a better knowledge of the causes of this remarkable blood affection by detailing the circumstances under which each particular outbreak shows itself. In this case too rich a diet, or, in other words, too great an amount of hydrocarbonaceous and albumenized matters having been supplied to the animals, would appear to be the chief cause of their succumbing to splenic apoplexy.

OBSERVATIONS ON A FEW CASES OF PORRIGO.

By Alex. E. Macgillivray, Veterinary Surgeon, Banff.

Porrigo, otherwise *Tinea,* I have met with among the lower animals in various forms, such as *P. scutulata, P. decalvans,* and *P. favosa.* The first of these is very common amongst cattle, horses, &c.; the second, not so common, I have seen in cattle, horses, dogs, and hares, and the third, the least common of all, I have found in cattle and cats.

P. scutulata and *P. favosa* are extremely contagious and easily communicable, both from animal to animal and from animal to man. Instances of the transmission of *P. scutulata* from the lower animals, chiefly cattle, to their attendants occur every year, generally in spring and autumn.

More remarkable still, however, is the fact that the contagious *matèriel* from *P. scutulata* in the lower animals will produce clearly defined *P. favosa* in the human subject. I

know of four well-authenticated cases of this, two of which came under my own observation—one in 1868 and the other in 1869. This is perhaps easily accounted for by considering *P. scutulata* as merely an "accidental variety" of *P. favosa* (*vide* Mr. Fleming's remarks in the *Veterinarian* for October last). Both the instances referred to occurred on *cattlemen:* in the one case the *favi* appeared on the back of the right hand, and in the other on the upper lip, in the moustache.

The *favi* on the back of the hand were confined to a spot rather larger than a shilling piece; flattish, pustular-looking, elevations of the epidermis existed, with a good deal of surrounding inflammation. In three or four days these *favi* apparently burst, and the discharge from them gradually formed one large scab or crust, of a dark, nearly transparent yellow colour, completely covering the spot where the *favi* or so-called pustules had been. This almost circular yellow-crusted spot was treated with some simple caustic, and afterwards well washed with warm water and soap. A day or two subsequently the yellow crust fell off, leaving a delicately dark and glistening cuticle below. The disease was now supposed to be checked; not so, however, for in a short time a new cluster of *favi,* precisely like the first, made their appearance. Happening to make a visit to the farm at this juncture, the cattleman again showed me his hand, and I rubbed the circular spot with a smart application of *Ung. Hydrarg. Bin. Iod.,* which had the desired effect.

In the other case, where the affection attacked the upper lip, the patient presented a most ludicrous appearance. At the time I saw him the superincumbent transparent yellow crust (or, rather, series of crusts) covered the whole upper lip, and was fully one third of an inch deep. The disease commenced in this case also with the usual clusters of flat pustular-looking *favi,* which, passing through the ordinary course, and spreading, finally presented the appearance mentioned. I believe the cure in this case was extremely tardy, partly owing to the ulcerated state of the underlying cuticle and partly from repeated recurrences of the disease.

The subjects of both these attacks undoubtedly received the contagious *matériel* while engaged dressing the cattle affected with *P. scutulata.*

The latter form of *Porrigo* is, as already mentioned, very common amongst cattle. It is easily distinguished from *P. favosa* by the light grey colour of its attendant scabs or crusts, by the small size of its introductory *achores* or pus-

tules, by the want of any peculiar inflammatory appearances around these *achores*, and by its occurrence generally in detached more or less irregularly circular spots, constituting what is vulgarly known as RINGWORM. Such is *P. scutulata*.

Its transference from animal to animal, and from animal to man, is so simple and so likely to take place that the utmost care is necessary to prevent its spread. I shall just mention two out of many instances to this effect.

In the autumn of 1869 I was consulted about some young cattle affected with *P. scutulata*, and I prescribed the usual remedies. On calling at the farm about a week after I found that two young horses, a seven year old half-bred mare, *and the boy who attended the horses and cattle*, had all become affected with the disease, having most undoubtedly received the contagion from the previously diseased cattle. The diseased spots were on the inside of the boy's arm, between the wrist and elbow.

On another farm, some three miles from this, the herd-boy caught the disease from some young cattle under his charge. The back of one hand and the outside of the arm in this case became affected. A little girl, the farmer's grandchild, unfortunately caught the contagion while romping with the herd boy at meal times. Besides several other diseased spots there was a very large one on the centre of this girl's forehead; the effects of the disease on this spot were visible for more than a year, having been extremely difficult to eradicate.

I may here remark, what has often attracted my attention, that the superincumbent crust of *P. scutulata* are darker in colour in the human subject than in the lower animals, and are not so thick or deep as those of *P. favosa*.

During the month of November, 1871, two very interesting cases of *P. decalvans* came under my notice; the one in a hare (*Lepus timidus*), and the other in a young retriever dog. Luckily, I was enabled to make a close examination in both animals with a pretty strong object glass.

This variety of *Porrigo* is the most singular of all, having very few distinctive characteristics common to the others, and yet without doubt originating in a similar parasitical cause. Like the other varieties, it often occurs in nearly circular spots; unlike the others, however, these spots are almost invariably void of the usual so-called pustular eruption or *achores*: at any rate, I have never met with them of even the most minute description. There being no *achores*, and

commonly little or no exudation, the want of an overlying crust or scab is a marked characteristic of this variety of *Porrigo*. The spots, generally very distinct, seem quite denuded of hair, and are mostly of a light greyish-white colour. They may appear on any part of the body, but are most common about the head and neck.

In the hare above mentioned the disease manifested itself in two very well-defined spots on the abdomen, near the umbilicus; these spots were quite bare, light in colour, slightly moist, and to the naked eye perceptibly scaly. On bringing them under the object glass they presented a most beautiful appearance. Over the whole diseased surface there were still to be seen many remaining stumps of hair; and where these emerged from the epidermis I could plainly discover small spherical, nearly transparent bodies, apparently in connection with or attached to the hair, and often penetrating into the epidermis along with the hair radicle. These spherical bodies were very minute, but yet quite easily distinguished; in some cases there were two of them to one hair, and more rarely, some appeared to have a cylindrical body or radicle attached to them, which also seemed to descend along with the hair into the epidermis. From the openings of the hair follicles, where the hair had disappeared, there seemed to be a slight exudation of a glairy description, but of this I could not make myself certain. The scales, although scarcely perceptible to the eye, were under the glass quite distinct, and had assumed a delicately pinkish-yellow tinge. I should say, however, that the scaly appearance was owing to simple exfoliation of the epidermic layers, and that the seemingly yellowish tinge was due to the almost imperceptible exudation from the empty hair follicles.

The opinion which I formed from what is related above was, that the spherical and pyriform bodies visible at the entrance of the hair into the epidermis were neither more nor less than the usual Cryptogamic fungi, or parts thereof, to which the various forms of this disease owe their origin, namely, the *Achorion Schönleinii*, &c., mentioned by Mr. Fleming in the paper above referred to. Further, that the exudation from the vacant hair follicles probably contained innumerable sporules or germinal matter ready to produce the disease in any proper nidus—I mean that the pinkish-yellow desquamated scaly epithelia of the disease-laden epidermis would unquestionably be the medium of conveying the affection, under favorable circumstances, to other animals. I was disappointed in making a microscopic examination of either the exuded or scaly matter.

In the case of the young retriever dog the *P. decalvans* was found to encircle both eyes, to fully the extent of two thirds of an inch broad around each eye. There was also a spot about the size of a sixpenny piece on the near forearm. The disease in this case had existed about six weeks, and had received scarcely any treatment. When I examined the puppy on the 9th of November it presented the following appearances:—To the naked eye the affected parts were grayish-white in colour, destitute of hair, quite dry, and rather wrinkled-looking. Under a good object glass a few isolated hairs and multitudes of scales were visible; but no exudation, no spherical bodies, and no moistness. Apparently the disease had run its course and come to a natural termination; no doubt, however, but these dry-looking scales contained the usual fungoid germs ready to produce anew the *porrigo* under favorable circumstances. In fact, on afterwards examining the dried scales under the microscope, subsequent to their being well soaked in some warm distilled water, their origin, nature, and composition became quite obvious, the usual fungoid germs or sporules and cylindrical bodies being clearly distinguishable. After seeing this I advised the dog's owner to apply a weak mercurial ointment, which had the desired effect.

A rather laughable instance of the transmission of *P. decalvans* from the lower animal to the human subject came under my notice in the month of June last. A young commercial gentleman, belonging to this locality, who is very fond of dogs and of doctoring them, happened to come once or twice in contact with a half-bred mastiff dog which was extensively affected with this disease. After handling the dog he had, *as a matter of course*, handled the hair about the back of his own head; in consequence of which, about a week or ten days afterwards, the hair began to fall off from his occiput, leaving a spot about the size of a penny piece quite bare and bald in a very short time. Here was a pretty story indeed—a young fellow of five and twenty becoming thus prematurely bald.

The denuded spot, when I saw it, was rather livid looking, and had not a single vestige of a hair left; besides which it was considerably lighter in colour than the surrounding hair-covered scalp. I advised this bald young gentleman to consult a medical man, and get the disease stopped at once, in which case the hair would soon appear again. I need only add that the result proved that my diagnosis and prognosis were both correct.

In the month of October last, at a farm about five miles distant from this place, I discovered a very curious and inter-

esting outbreak of *P. favosa* amongst young cats. The farmer informed me that he had lost five young kittens, all diseased, within seven weeks, and that there were two still remaining, also diseased, which I should see. None of the kittens had been bred on the farm, but had been got at different times from other farms in the locality, and had been destroyed or died at various times as they became apparently hopelessly diseased. Every fresh kitten or kittens, however, as surely as they arrived invariably became affected; and the remaining two, the sixth and seventh, were labouring under precisely the same disease. What could it be?

On examining the two kittens, which were comfortably ensconced on the parlour hearth-rug, I discovered to my surprise that they were evidently both the subjects of *P. favosa*. There were the peculiarly shaped *favi* and favous crusts, on the head and feet chiefly, of both kittens. The feet or paws were slightly swollen and somewhat painful, as I thought from the gingerly way in which they walked about.

Whether the first pair of kittens brought the disease with them, or got it after they came, will never be known; certain it is, however, that they left the vitally contagious germs behind them, which became the means of infecting their five successors.

As the farmer had two young children daily playing and tumbling about in the parlour, I advised him to destroy the two remaining kittens for fear of infection, even although, as he said, the children were not allowed on any account to touch the kittens. I regretted much afterwards that I did not take the kittens with me for experiment, but one loses many a good chance in this way for want of forethought.

I shall draw my remarks to a close by mentioning that the cattleman, already spoken of as having had *P. favosa* on his upper lip in the spring of 1869, was again attacked with same disease in December last. The disease manifested itself this time on his right arm, about midway between the wrist and elbow, two irregularly circular spots about the size of a sixpenny piece each.

I had an opportunity of examining the diseased spots in this case before the usual favous crusts had formed, and found them considerably raised above the level of the surrounding epidermis, highly inflamed and irritable. One spot had three and the other four bright yellow flattish pustular-looking points, which were evidently the veritable *favi* of *Tinea favosa*. The contagium in this case had again been received while dressing young cattle affected with ringworm, *i. e. P. scutulata*.

The cattleman went to a pharmaceutical chemist and got the spots dressed with a preparation of mercury, and thus checked the further development of the disease.

This subject is worthy of more notice from the profession than it gets, and papers such as we have recently been favoured with by Mr. Fleming are but too seldom met with in British veterinary, or other journals.

ACCIDENTAL POISONING OF PIGS BY A DECOCTION OF DIGITALIS.

By Harry Olver, M.R.C.V.S., Tamworth, Staffordshire.

The following case having come under my notice, I thought that you might deem it worthy a place in your valuable journal the *Veterinarian*. Its interest, perhaps, chiefly centres in the circumstance of the danger of unqualified men using poisonous substances, for probably it will not add anything to the qualified veterinarian's previous knowledge of the action of digitalis. Still I trust a record of the facts may be useful as a warning to others in the disposal of poisonous agents.

On Thursday, January 18th, Mr. J. German, of Broad Fields (about five miles from here), sent a message to request me to see some pigs which had been poisoned by foxglove (digitalis). On my arrival I received the following information:—it appears that Mr. German had an old cart horse, the subject of a skin disease, which annually causes a loss of the greater portion of his hair, accompanied by irritation. His waggoner (an old confidential servant) had been told that a decoction of foxglove would cure the horse, so last summer he obtained some leaves of digitalis, and dried them, and on the evening of the 17th of January he boiled the dry leaves with a certain quantity of water, with the intention of dressing the horse on the following morning with the decoction when cold. A servant in the morning requiring the saucepan, and not knowing what was in it, emptied the contents into the pig bucket, thus mixing the decoction with other food, which was shortly afterwards given to five pigs, two small ones in one sty and three larger ones in another. The smaller pigs had the greater quantity, and also the strongest portion, as that given to the three larger ones, which were fattening, was further diluted with wash and meal.

I should state that all this was done without the knowledge of Mr. German, or any of his other servants or household.

Shortly after the pigs had taken the wash they were noticed to be ill, appearing very languid and sleepy, would not eat or drink, tried to vomit, but without effect, and continually passed small portions of fæces; there were also small flows of urine, accompanied with straining. The waggoner, on hearing that the pigs were ill, at once thought of his foxglove decoction, and, finding that it was gone, honestly explained the cause of the animals' illness. When I saw them (about twelve hours after they had taken the digitalis) I found one pig dead, and another dying; the other three were lying asleep and snoring heavily. These I immediately had aroused, and gave to each an oleaginous aperient, and kept them moving about, to remove as much as possible the sleepiness, and to give the medicine a better chance of acting. They remained in pretty much the same state for the next two days, passing fæces of a yellow colour, straining and voiding small quantities of urine, were very languid, and refused all food or water. On the third day they ate two or three potatoes, and gradually, but very slowly, regained their appetites and recovered. For more than a week, however, they appeared to suffer from the sedative effect of the agent, which was shown by their languid and sleepy condition.

On making a *post-mortem* examination of the two that died, I found acute inflammation of the mucous coat of the small intestines and stomach to be present. These viscera also contained a quantity of thin ingesta of a yellow colour. The kidneys were slightly congested, the bladder empty; the remaining viscera healthy.

The brain was not examined.

PARTURITION IN A BITCH, HINDERED BY VAGINAL POLYPUS.

By Jas. Watson, M.R.C.V.S., Douglas, Lanarkshire, N.B.

About the middle of January last I was called to a collie bitch, which the "farmer's lad" said was "going to pup but couldna' for the 'pup-bed' coming out." I learned that the bitch had been in labour since the previous day; that the farmer had frequently returned what he was pleased to call the "pup-bed;" that his so doing seemed to cause the ani-

mal great pain, and that she would not rest until it was thrust out again.

On examination I found a tumour about the size of a large hen's egg protruding from the vagina. At first sight it had every appearance of an everted bladder, but on manipulation I found it to be a firm fibrous tumour, with a long pedicle extending into the vagina. I at once put a ligature round the neck of the polypus and removed it with the scalpel, afterwards I gave by the anus ℥xx of laudanum in water. In about an hour afterwards the bitch was delivered of three pups, and has since done well. Vaginal polypus is said to be extremely rare in the human subject. I am not aware whether it is so amongst our patients, but I relate this case simply to show that such causes may occasionally hinder parturition.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from* p. 103.)

We now come to the examination of a series of Conifera, in which the cone-bearing element is not so obvious on a cursory view, as it requires the analytical reasoning of a botanist to make out that the apparent berry of the yew, the savin, and the juniper, has the same initial structure as the common fir cone; the two may be distinguished as follows:

1. *Strobilus or Conus.*—An amentum, the carpella of which are scale-like, spread open, and bear naked seeds, sometimes the scales with little cohesion; but they are often woody, and cohere into a single tuberculated mass. The firs described in our last are examples of these.

2. *Galbulus.*—Differs from the Strobilus only in being round, and having the heads of the carpella much enlarged. The fruit of the juniper is a galbulus, with fleshy coalescent carpella.*

We have now to notice the junipers, and the fruit of our common juniper is thus described by Dr. Pereira:

"Fruit commonly called a *berry,* but is in reality that kind of cone called by botanists a *galbulus,* which has fleshy coalescent carpella, whose heads are much enlarged. It requires two seasons to arrive at maturity. The galbulus is black

* 'Lindley's Introduction to Botany,' vol. ii, p. 24.

tinged with blue, and is scarcely more than half the length of the leaves."

The juniper is a native plant, scarcely attaining to the dignity of a tree, though those who have seen it growing on the fine oolitic elevations in the neighbourhood of Painswick, Gloucestershire, must admit it to be at least a noble and elegant shrub.

Dr. Pereira tells us that both the berries and tops are used medicinally. Their principal action is that of a diuretic, dependent upon a volatile oil, which is contained to a greater or less extent in all parts of the plant.

Professor Tuson, in his 'Veterinary Pharmacopœia,' mentions only the "Oleum juniperi" in the following terms (pp. 173-4):

"Composition.—$C_{10}H_{16}$.

"Mode of Preparation.—In Britain, by distilling the unripe fruit of *Juniperus communis* with water.

"Characters.—Colourless or pale greenish-yellow, sweetish odour, and warm aromatic taste; completely volatilised by heat.

"Actions and Uses.—Stomachic and diuretic. Given as a diuretic.

"Doses.—*Horse,* 1 drachm; *cattle,* 2 drachms; *sheep,* 15 minims; *pig,* 10 minims; *dog,* 2 to 5 minims.

"Mode of Application.—Suspended in water or some mucilaginous drink."

We have given these data to show that juniper oil is a powerful medicinal agent on animals in general; while in the human school Dr. Pereira, quoting Mr. Alexander's experiments, says—"It is in doses of four drops the most powerful of all diuretics."

Juniper berries distilled with spirits of wine, sweetened with sugar, forms Hollands or English gin, the direct diuretic action of which is much enhanced by the juniper, though there is reason to think that our common "old Tom" is perfectly innocent of oil of juniper, its diuretic properties being derived from the coarser oil of turpentine.

Cooley, in his 'Practical Receipts,' under the article "Gin," has the following:

"Gin (from *geneevre,* juniper) is flavoured corn spirit. This liquor was originally wholly imported from Holland, and hence received the name of *Hollands* or *Hollands gin,* and was a rich, smooth spirit, chiefly flavoured with juniper berries; hence the term *Geneva,* frequently applied to it, of which the English monosyllable *gin* appears to be a corruption or diminutive. The liquor at present known by this

name, of British manufacture, is, however, a very different article to that imported, and consists of plain spirit, flavoured with turpentine, and small quantities of certain aromatics. The *thousand and one* receipts for this article which have from time to time been printed in books produce a flavoured spirit, bearing *no resemblance* to the most esteemed samples of English gin, and, if possible, even more unlike genuine Hollands."

It would, indeed, seem that too many English "gin spinners" make an article wholly innocent of Genievre, but made strong by distilling turpentine and some aromatic seeds with coarse spirit, and this is afterwards made suitable (if not for consumption, at least for profit, of all except the consumer) for consumption in the "gin palace." For this delicious article we quote Cooley's "Receipt:"

"GIN, SWEETENED. *Prep.* Unsweetened gin (22 u. p.), 95 gallons; lump sugar, 40 to 45 lbs.; dissolved in clear water, 3 gallons; mix well; add alum, ¼ lb., dissolved in water, 3 or 4 quarts; rummage well for 15 minutes; then add salt of tartar, 2 oz., dissolved in water, 1 or 2 quarts; again rummage well, and bung down close. In a day or two it will be fine, and ready for sale or racking."

Of this the product will be a hundred or more gallons, according to the quantity of water the conscience of the operator will run to.

Now, as this is the favourite beverage of the artisan, as well as the idle and profligate, especially in our large cities, and as gin is increasingly ordered by the medical man for pauper patients, it is well that it should be known that it is not made on any fixed principles, but depends wholly upon the taste and consciences of the operators, both as to its strength and the nature of its ingredients.

The Savin (*Juniperus Sabina*) must next claim our attention. This is a diminutive ornamental shrub, introduced to our gardens from Southern Europe or Asiatic Russia. It has small densely imbricated leaves and smaller fruits than the common species. Though not a British plant, it would appear that the exact position of any quantity of savin, nay, often of a single bush of it, is tolerably well known, as we have been acquainted with more than one locality from which it was yearly abstracted, report said, by some carter or carters, "to fine the cwöats of the 'osses." In our own parish there is one tree, in a private garden, known to every carter, horse, or cow-keeper, all over the village, all of whom have some time or other had a bit of it, which they have used for worms, or, as our carter expressed it, "for fining the cwöats,

which is all as one, for 'osses and cows is allays hide-bound if they have worms." They are aware of its dangerous qualities, as they describe it as "main strong," and the favourite formula for its use is. "*Savage* chopped up fine as much as will lay on a shilling, sulphur, brimstone (*sic*), and *ninetre* (*sic*), gid um vasting. Dree or four doses o' this will bring away worms a fut long (if thaäy be thur); but if they beant, 'tis sartain to 'prove* thayre cwoäts." Now, we have quoted this *verbatim et literatim,* for the express purpose of showing the kind of "doctoring" which prevails in the country, confessing with sorrow that things are so.

Now, if we inquire how this is to be remedied, our simple answer will be by increased education; educate the professional man and the farmer, and the time will come when knowledge will descend to the labourer and men in charge of our stock. Knowledge always did descend from a higher stratum to a lower, and though there are those who tell us to educate the working man, and religion, science, and politics will all be improved; yet we feel quite sure that unless the education of our professed men of science and professional men is of the highest kind, that of those below will be but make-believe quackery.

We have been unwillingly led into this digression from thinking over the uses by the rustic of savin with our domesticated animals; but such thoughts are only intensified when we consider the uses to which it is put with human beings.

Dr. Pereira says that savin is sometimes employed for criminal purposes, and, therefore, sometimes becomes the subject of medico-legal inquiries, and he refers to Morhenheim as mentioning the case of a woman, thirty years of age, wl o swallowed an infusion of savin to occasion abortion. Violent and incessant vomiting was induced. After some days she experienced excruciating pains, which were followed by abortion, dreadful hæmorrhage from the uterus, and death. On examination the gall-bladder was found ruptured, the bile effused in the abdomen, and the intestines inflamed. The popular notion of its tendency to cause abortion leads, on many occasions, to the improper use of savin, and the above is not a solitary instance of the fatal consequences thereof (see 'Materia Medica,' vol. ii, pp. 330-31).

That savin is a powerful medicinal plant there can, then, be no doubt, and, therefore, we are led to hope that more care with regard to its active nature might lead to a salutary use of it, while it guarded against its abuse.

* The Doric Dorset for improve.

Taxaceæ.—An order represented by the yew, *Taxus baccata,* must now claim attention. The tree is too well known to need description; but there are such conflicting opinions with regard to its powers, that it will be neeessary to notiee them in this place. That the ancients held the yew to be poisonous is beyond doubt, and this seems to be confirmed by the reports of poisoning of cattle which one sees from time to time in the public prints. Again, the yew is a somewhat near ally of the savine, which we have already seen to possess very active properties; still we are not inclined to put confidence in all that has been stated with regard to the direful qualities attributed to the yew. Thus Plutarch says its shade is fatal to all who sleep under it. Pliny states that the berries are poisonous. Gerarde, however, after citing the different opinions of the ancients upon the poisonous qualities of the yew, as quoted by Dr. Symes, says, "All which, I dare boldly affirm, is untrue, for when I was young and went to school, divers young schoolfellows, and likewise myself, did eat our fils of the berries of this tree, and have not only slept under the shadow thereof, but among the branches also, without any hurt at all, and that not one time, but several."

In the country we are very particular in keeping cattle from yew hedges, and more especially from the dried clippings of these. Now, if this be the powerful plant supposed by some, it is curious that the drying of its foliage should result so contrary from that of all other plants, as without doubt even foxglove, henbane, and hemlock lose much of their power, nay, become comparatively inert by drying.

This view of the subject has led some people to conclude that, after all, the apparently poisoning effects result rather from mechanical causes; and as the leaf is small, with a sharp point and somewhat rigid even in the green state, it will be even more so when dried, and so the greater power of the dried over the green plant is so far accounted for.

For ourselves, after having seen the autopsy of cows that had died after yew, we confess to be still in great doubt upon the whole matter, for in no case were the leaves digested, so that how they could act in their whole state as an irritant poison of so potent a character as has been assumed, seems a great difficulty.

Couple this, again, with the observed facts that cattle often die from the effects of dry food, which becomes impacted in the stomach instead of properly digesting, and we think there is reason to believe that though the yew belongs to an active section of plants, yet that the stories asserted of its powers

are to a great extent fabulous; and though we would not deny that it has great powers, we cannot help concluding the observed effects of its consumption by cattle, which, by the way, is usually in a gluttonous quantity, expressive of depraved appetite, are due to a combination of causes in which the extreme difficulty of decomposition or digestion of yew leaves is always prominent.

Still, whatever the action of yew on the animal economy may be, there is no doubt that cattle often fall victims to partaking of it, and it is, therefore, not to the credit of science that there should be any doubts upon the matter. We shall, therefore, look forward with much interest to some more reliable information upon the subject than we now possess.

THE TIME OCCUPIED IN THE PASSAGE OF FOOD THROUGH THE DIGESTIVE ORGANS OF THE HORSE.

By Henry Jarvis, Student at the Royal Veterinary College.

These experiments were made with a view of ascertaining how long a time it takes for the food to pass through the alimentary canal of the horse. Four horses were submitted to experiment. The horses in question had been feeding for several weeks upon black oats. They were now placed on white ones, care being taken to see in how many hours the white oats could be detected in the fæces. The following results were noticed:

No. 1.—This horse, after being fed, underwent a journey of about nine miles. The white oats made their appearance in the feculent matter in twenty-two hours.

No. 2.—This horse, after partaking of the white oats, had half an hour's exercise. The white oats were observed in the fæces in twenty-four hours.

No. 3.—This horse was kept quiet in the stable, and the white oats were recognised in twenty-seven hours.

No. 4.—This horse was kept under similar conditions to No. 3. The white oats made their appearance in twenty-seven hours and a half.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of January, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Bremen .	London .	Foot-and-mouth	83	...	...	...	83	83
Hamburg .	Grimsby .	„	...	4	...	...	4	4
„	Hartlepool	„	33	...	...	...	33	33
„	Hull . .	„	70	20	...	...	90	90
„	„	Sheep-Scab .	...	1	...	...	1	1
„	London .	Foot-and-mouth	53	...	...	...	53	53
„	Newcastle.	„	58	...	...	...	58	58
„	Sunderland . .	„	...	20	...	...	20	20
Harlingen .	Hull . .	Sheep-Scab .	...	5	...	...	5	5
Total . .		Foot-and-Mouth	297	44	...	...	341	341
„ . .		Sheep-Scab .	...	6	...	...	6	6
Total . .			297	50	...	...	347	347

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 12th February, 1872."

CATTLE PLAGUE.

From France the accounts are still very unsatisfactory. The plague is prevalent in the following departments:—Aisne, Ardennes, Calvados, Eure, Eure et Loire, Meuse, Nord, Oise, Pas-de-Calais, Seine Inférieure, Seine et Marne, Somme, and Vosges. It has also recently broken out in the town of St. Pierre-les-Calais, where seventeen animals have been slaughtered.

Round Amiens also the plague continues its ravages.

Belgium had just succeeded by prompt measures in stamping out the disease when another outbreak occurred in the beginning of February, at Petthem, near Thielt, which was also quickly suppressed by the adoption of the ordinary measures of slaughter and isolation.

No more complete contrast in the methods of dealing with cattle plague can be conceived than is presented by these two countries. France during the early part of the outbreak, when repressive measures would have been most effectual, was engaged in trying very interesting but very unproductive experiments in therapeutics, while Belgium at the outset adopted the so-called barbarous, but uniformly successful, eradicator, the poleaxe, not, however, without many protests from scientific men, who did not approve of "gaining a triumph at the expense of their art."

A desperate effort has been made to introduce the homœopathic system of treatment, and the subject was brought before the legislature, but the Minister of the Interior decided not to modify the method of procedure which had hitherto been carried out with such complete success and at such a trifling cost to the country. It appears that from the commencement of the outbreak of cattle plague in Belgium, on November 12th, 1870, to January 26th, 1872, only 465 animals were sacrificed; of this number, 240 were killed while suffering from the disease, and 165 which were suspected.

In Central Europe there is nothing worthy of special notice in the progress of the disease. In Poland it exists in the south-eastern frontier of the government of Lublin.

In Gallicia the disease exists in three districts, and also in one district of Moravia.

FOOT-AND-MOUTH DISEASE.

Taking the whole kingdom, it may be safely said that the disease is on the decline, although several fresh outbreaks have occurred in different parts of the counties of Cambridge, Norfolk, and Cumberland. Meanwhile it is worthy of remark that during the decline of the disease in this kingdom it has been raging in and around Hamburg, and nearly all the cargoes of animals which have been landed in this country from that port have been more or less diseased, and in several instances the entire cargo has been found to be affected. Some credit is due to the port inspectors for the exercise of vigilance which has hitherto prevented any spread of disease from numerous centres round the coast.

PLEURO-PNEUMONIA.

There is a slight increase in the number of the attacks since the last report, although the number of infected counties remains nearly the same.

SHEEP SCAB.

This disease is still extremely prevalent in some districts, and altogether returns have been received from forty-nine counties in England and Scotland. We observe that in one infected county the subject was dealt with in a very cavalier manner at an agricultural meeting, and the members objected to stringent measures to sheep which were merely "*touched with the scab.*" Owners of valuable flocks which may also be *touched* with the disease, by coming in contact, even indirectly, with the scabby ones, do not generally think so lightly of the matter.

GLANDERS.

Recently this virulent affection has increased, and we have met with cases among the higher class of horses, which are generally held to be exempt. Doubtless much mischief is done by the movement of diseased animals by rail and road, when the signs of the malady are not sufficiently defined to enable an ordinary observer to form an opinion of its true character. The provisions of the law, as it stands,

would prove sufficient to arrest the spread of the disease if they were actively enforced, but unfortunately there are many difficulties in the way of carrying them into effect.

Facts and Observations.

The Singeing of Army Horses.—An order has been issued from the Horse Guards to the effect that horses are not to be singed to an extent to render blankets necessary as a protection from the weather, and under no circumstances is clipping to be permitted.

Inefficacy of Immature Cantharides.—Recent investigation shows that young cantharides do not possess the epispastic property, and it would seem that in medium-sized insects it is equally wanting. It is only the full-grown insects that will raise blisters. Cantharadine appears not to be developed until the complete maturity of the insect. In purchasing cantharides, therefore, those only should be chosen which have attained their full growth.—*Pharm. Journ.*

Adulteration of Catechu.—It is a well-known fact, that catechu is often adulterated; the sophisticated substance injuriously affecting various operations in which it is employed, especially dyeing and calico-printing. According to Tissandier, genuine catechu, when exhausted by means of ether, loses 53 per cent. of weight, leaving, after drying, 47 per cent. of residue. A mixture of catechu and alum gives a white precipitate with nitric acid and with chloride of barium. —*Ibid.*

Preparation of Hydrogen Gas.—It is stated that MM. Tessié du Motay and Maréchal have lately discovered a new and economical method of producing hydrogen gas. The process consists in heating the hydrates of the alkalies and alkaline earths with coke, coal, charcoal, &c., to a red heat, whereupon carbonic acid and hydrogen are given off abundantly; and as the decomposed hydrates, especially that of lime, can be used indefinitely, by simply remoistening them with water, the method is very economical. In this operation the hydrogen gas is generated without any special production of steam, and may thus be produced without any other generating apparatus than the retorts themselves; and as these retorts are not exposed to the direct action of the steam, they are not subject to any interior deterioration. This

process, it is said, in conjunction with the method of obtaining cheap oxygen from the manganates of soda, discovered by the same chemists, is likely to create a revolution in many industries, and especially in metallurgy.—*Journ. Chem. Soc.*

On a New Reagent for Alkalies.—The fresh leaves of *Coleus Verschoffelti*, an ornamental plant, are put in a glass bottle and covered with absolute alcohol, containing some drops of sulphuric acid, and macerated twenty-four hours, when the fluid is decanted and other leaves introduced into the same vessel after the exhausted leaves are removed, the liquid being retained. The tincture thus obtained is charged with the colouring matter of the leaves; it is filtered and strips of paper are introduced, which are then dried in the air.

The best paper thus obtained has a magnificent red colour, which passes more or less to a fine shade of green, by the action of alkalies and alkaline earths. The author considers it better than reddened litmus because more sensitive; it is not modified by carbonic acid, but should be kept close.—M. Boettger, *Journ. de Pharm.*

On the Influence of Sugar on Magnesia used as an Antidote.—In 1846 M. Bussy, and afterwards Christison and others, recommended magnesia as an antidote for arsenic and other metallic poisons. M. Carles, supposing that sugar (as in the case of lime) would, by rendering magnesia soluble, increase its efficacy, tried the mixture of sugar, water, and magnesia; but, to his surprise, found that it rendered the arsenite of magnesia soluble, and that sugar tends to prevent the formation of arsenite of magnesia, and is therefore useless and pernicious.

When, however, saccharated magnesia is used with the salts of lead, copper, antimony, and mercury, it hastens and facilitates their decomposition without uniting with them, and in some instances the sugar of itself acts by reducing the oxides. For this last reason it may be better to use honey in lieu of sugar.

In conclusion, *except in the case of arsenic*, the association of sugar with magnesia augments the efficacy of the base employed as a general antidote. Two and a half drachms of magnesia, five or six drachms of sugar, and three fluid ounces of water (boiling), appear to be the most convenient proportion.—*Répertoire de Pharm.*

THE VETERINARIAN, MARCH 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—Cicero.

THE ROYAL VETERINARY COLLEGE.

Under ordinary circumstances, the changes which have just taken place at the Royal Veterinary College would furnish materials for critical observation in this Journal; but the fact of the appointment of Professor Simonds, the chief editor, to the post of Principal, renders it almost impossible for us to discuss the recent events which have transpired at our *alma mater* with the necessary freedom which such a subject demands, without at the same time indulging in personalities which would be distasteful. But, on the other hand, the omission of any allusion to matters in which the whole profession is interested would justly expose us to censure and reproof.

A method of escape from the dilemma offers itself in the form of a simple narrative of facts in the order of their occurrence. On the death of the late Principal, Professor Spooner, in December last, our colleague was requested by the Governors of the college to assume the directorship until another Principal should be elected at the next General Meeting of Governors, which was held on February 6th and adjourned to February 20th, on account of the meeting of Parliament on the first-named day compelling a majority of the Governors to be absent.

The adjourned meeting was well attended, and the first business performed was the election of a Principal. That Professor Simonds should have been selected to fill the vacant office is no more than the profession expected. As the senior officer in the institution, the position reverted to him in the natural order of things; of his fitness for the post we must leave his reputation to speak in words from the utterance of which we are debarred; but at any rate, we are permitted to draw our conclusion, in common with our readers, of the

future progress of the college under his rule, by reference to the steps which have already been taken to extend and improve the course of study. First, the members of the veterinary profesion will be gratified to learn that a systematic course of instruction in the practical duties of the veterinary art has been established. In addition to the daily hospital rounds, special clinical demonstrations are held every Tuesday and Saturday in the theatre, and particular days set apart for operations. Besides which a card, stating the nature of the disease from which the animal suffers, with general instructions as to its management and treatment, is posted up in every stall or box, but more especially for those who are advanced in their studies.

In addition also to clinical clerks, dressers, selected from the second session pupils, are appointed week by week to attend to the patients under the direction of the professor, while the oversight of the dissecting-room duties has been placed in charge of monitors who act under the assistant-professor of anatomy.

Chemistry, at length, is likewise being taught as an art as well as a science. The chemical professor has obtained permission to carry out his own views, and the laboratory has been fitted up for the accommodation of a large class of students. At present the laboratory work is not compulsory, but we learn that over seventy pupils have availed themselves of the opportunity thus afforded them of obtaining practical knowledge and manipulative skill in a department, the importance of which has not yet been fully recognised by the veterinary profession.

Further changes in the internal arrangements of the College are contemplated, and will be discussed at the adjourned meeting of the Governors, and among them not the least important is the establishment of a summer course of instruction, which we may venture to predict will include botany, practical pharmacy, the principles of shoeing, as well as the performance of operations on the dead subjects, by the students. Of the vast importance of these additions to the curriculum, particularly the first of them, little need be

said. The connection which exists and which is gradually becoming better understood, between the diseases of plants and those of animals has placed botany among the necessities of a veterinary surgeon's education, and a summer course of lectures and practical instruction on the subject will help to fill up a long interval which is at present passed in unneeded recreation, or fruitless efforts to gain practical knowledge. The present College staff, we may conclude, will be strengthened in order to meet the requirements of the enlarged curriculum; but of the precise nature of the changes which will be made in this respect we are not at present in a position to speak.

With a view to this end, however, Mr. Pritchard has been raised to the position of Professor of anatomy from that of deputy professor, and as he is not on the list of editors, there is nothing to prevent our giving expression to our satisfaction at his elevation—a satisfaction which will be shared by all the readers of the *Veterinarian*.

We had hoped to have been able to refer more definitely to a completed scheme, but the amount of business before the Governors at their last general meeting compelled them to reserve many pressing matters for further consideration; we felt, however, that the members of the veterinary profession would expect some allusion to be made by us to College affairs, and this circumstance has induced us to place before them all the information in our possession without delay.

One thing more we have, however, to add, which is, that Professor Simonds relinquishes all other duties in order to devote his whole time and attention to College matters and the direct interests of the profession. He has also undertaken to lecture on general as well as special pathology of domesticated animals.

Extracts from British and Foreign Journals.

SUBSTITUTION OF SALTS COMPOSING THE BONES.

That certain salts entering into the composition of the body can be substituted by others belonging to the same series, if supplied in the food, has long been known. Some

good experiments, however, have been made in the course of the past year by M. Papillon, and are recorded in the *Comptes Rendus*. In one of these a young pigeon was dieted on distilled water to which hydrochlorate, carbonate, sulphate, and nitrate of potash were added, and with grain made into a paste with strontia. The bird remained in perfect health for nearly eight months, when it was killed, and an analysis made of its bones, with the following results:—In 100 parts there were of lime 46·75, of strontia 8·45, of phosphoric acid 41·80, and of phosphate of magnesia 1·80; residue 1·10. In a second experiment a white rat ten days old was subjected to a similar regimen, except that phosphate of alumina was substituted for the strontia given to the pigeon in the proportion of about a grain and a half per diem. The animal remained to all appearance in good health for about six weeks, when it died suddenly in convulsions. An autopsy of the bones showed that in 100 parts there were of alumina 6·95, and of lime 41·10 parts. Another animal of the same litter was supplied with phosphate of magnesia instead of phosphate of alumina, and was killed at the same time. Analysis of its bones showed the presence of magnesia in the following proportions in 100 parts:—Magnesia 3·56, lime 46·15. In all the animals the appearance presented by the bones was natural, and they seemed to possess their ordinary physiological peculiarities.—*Lancet.*

NEW TEST SOLUTION FOR SUGAR.

The author recommends the use of glycerin in place of tartaric acid for the preparation of an alkaline copper solution for the detection of sugar. Glycerin entirely prevents the precipitation of oxide of copper, and the solution prepared with it has the advantage of being less liable to alteration when kept than the tartaric solution is.

To prepare a test liquid of this kind 16 grammes of sulphate of copper should be dissolved in 64 c.c. of water; to this solution is gradually added 80 c.c. of soda solution (1·34 sp. gr.), then 6 or 8 grammes of glycerin, which redissolves the hydrated oxide of copper that had been precipitated.

This liquid should not become turbid when diluted with two thirds of bulk of water, nor when boiled.

The copper solution may also be prepared by dissolving hydrated oxide of copper in a mixture of glycerin and caustic soda. The hydrated oxide is best obtained by adding soda solution to an ammoniacal solution of sulphate of copper, washing the preciptitate, and drying over oil of vitriol.

For 6 grammes of this hydrated oxide there should be 6 or 8 grammes of glycerin, 50 grammes of water, and 56 grammes of soda solution of the strength above mentioned. This mixture is then diluted as may be requisite. The author prefers this solution to the other. It does not become turbid with alcohol.

The solutions will not bear considerable dilution without depositing hydrated oxide of copper, but this may be prevented by increasing the proportion of glycerin or of soda.—J. Loewe, *Zeitschrift für analytische Chemie.*

THE EXISTENCE AND FORMATION OF SALTS OF NITROUS OXIDE.

E. Divers, M.D., says—Metallic sodium thrown on a solution of an alkaline nitrate, was found by Schonbein to reduce it to nitrite. By using the sodium in the form of amalgam, the complete reduction of the nitrate to nitrite can be readily effected, and silver nitrite freely precipitated from the solution by first neutralising it with acid, and then adding silver nitrate.

But as soon as nitrite is thus formed by the sodium, it itself begins to suffer reduction, as well as the remaining nitrate, by the action of more sodium. This reduction of the nitrite is rendered evident by the effervescence which attends it, the gas given off consisting of pure nitrous oxide. If excess of sodium amalgam be gradually added to the nitrate solution, and its action moderated by keeping the vessel containing the mixture in a stream of cold water, the effervescence only becomes very lively when the sodium added has nearly reached the proportion of two atoms to one of the nitrate used. When four atoms of sodium have been oxydised by the solution, the further addition of it is without effect; no more effervescence takes place, and the sodium remains unchanged in the mercury.

The very alkaline liquid which is left by the reaction contains a new salt, though in relatively small quantity, the salt of nitrous oxide, NaNO. The reaction occurring may be thus expressed:

$$\underset{\text{Nitrate.}}{NaNO_3} + Na_2 = \underset{\text{Nitrite.}}{NaNO_2} + Na_2O.$$

$$\underset{\text{Nitrite.}}{NaNO_2} + Na_2 = \underset{\text{New salt.}}{NaNO} + Na_2O.$$

After neutralising the alkaline liquid by acetic acid, it gives

a yellow pulverulent precipitate with silver nitrate. This precipitate, when thoroughly washed, may be dried at a gentle heat. It has the composition AgNO. The original solution containing the sodium salt, when acidified with acetic acid and heated, evolves nitrous oxide gas. The author gives full details of the various reactions of this interesting compound.—*Proc. Roy. Soc.*

SULPHUROUS ACID AS A DISINFECTANT.

Sulphurous acid gas is liberated by burning sulphur. It is a powerful destroyer of the germs of contagion, but owing to its deleterious and suffocating odour it cannot be introduced in any quantity to the room of a sick person; nevertheless, it is very useful as an agent of disinfection.

Mr. Startin, the senior surgeon to the Hospital for Diseases of the Skin, Blackfriars, in a communication to the *British Medical Journal*, recommends the following method of fumigation to be used for the purpose of preventing the spread of contagious diseases. For disinfecting beds and bedding, a warming-pan or some other suitable utensil, containing a few live embers, upon which a teaspoonful or two of flowers of sulphur has been thrown, should be passed to and fro between the sheets until the combustion of the sulphur is complete. After a few minutes the patient may enter the bed. Should the fumes prove too stimulating for his respiratory organs, they may be intercepted by holding a loosely folded damp handkerchief before the mouth until they have subsided. To disinfect clothing it should be lightly sponged or sprinkled with water containing well-mingled milk of sulphur, in the proportion of a teaspoonful to a pint of water, and then ironed with a flat iron, heated to a temperature sufficient to volatilize the sulphur without burning the clothing. This process should be repeated according to the extent and duration of the infection.

Dr. Walter Fergus, writing to the same journal, says that he has found the readiest method of developing sulphurous acid fumes to be by igniting two parts of flowers of sulphur and one of powdered charcoal on any incombustible surface, such as a saucer or a bit of tin. He says also that sulphurous acid is not so much an irritant as it has the appearance of being. An atmosphere highly charged with it may be breathed with very small inconvenience, which soon passes off. Dr. Fergus has used it with benefit in cases of the affection known as "hay-fever."

During the recent epidemic of smallpox in London, sulphurous acid has been largely used by the local authorities for disinfecting the rooms in which patients have been nursed. The room is closed up, and so much sulphur burnt within it as to render the air of the apartment quite irrespirable. But as it is difficult to light and maintain the ignition of a large quantity of sulphur, bisulphide of carbon has been chiefly employed for the generation of the gas. This liquid, as is well known, burns readily, producing sulphurous and carbonic acid gases by its combustion. About a pint of this substance is placed in a metallic vessel within the room, and lighted before closing the door.

A solution of sulphurous acid gas in alcohol has also been recently introduced as a convenient agent for disinfection. This gas is much more soluble in alcohol than it is in water. The alcoholic solution now offered contains in solution 100 times its volume of sulphurous acid gas.—*Year-Book of Pharmacy.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

STUDY ON TINEA FAVOSA IN THE DOMESTICATED ANIMALS.

By M. F. Saint-Cyr, Professor at the Lyons Veterinary School.

(*Continued from p.* 60.)

IV.—*New Examples of Transmission of the Favus of Animals to Man.*

In a communication that I had the honour of laying before the Medical Society of Lyons last January, I related how, in making experiments on Tinea in animals, I had myself contracted the malady, which assumed on my hand the anatomical configuration of *Herpes circinnatus*.

The following new and confirmatory facts, gathered in such a way that there could be no doubt either as to the etiology or nature of the accidents—which were carefully attended to by Dr. Rollet—were observed in three students of our school; and I had the honour of presenting one of these young men to the Medical Society at one of its meetings.

These are the three observations:

1. M. Mahérault, third years' student at the Veterinary

School, was charged with the duty of attending to, and dressing the three diseased rabbits mentioned in the preceding observation. Knowing, from experience, the danger that was incurred through being in contact every day with patients of this kind, I recommended him to take all precautions with regard to keeping his skin free from the *débris* of the favus crust which might adhere to his clothes. But I also knew that all the precautions in the world would not ensure complete security; and, therefore recommended him to watch attentively, and inform me whenever he saw anything on himself of a suspicious nature.

A month passed without our fears being realised, but on the 8th of July M. Mahérault told me that he had remarked two suspicious looking patches, one situated on the left thigh, the other on the chest, a little below the right breast.

I examined these lesions carefully, and although I could discover no trace of the parasite, I sent him next day to Dr. Rollet, who, not being able to arrive at a sufficiently satisfactory diagnosis from the character of the patches, advised that the malady should be allowed to take its natural course for some days, at the same time watching it. This was done. On the 10th a new patch appeared on the chest, a little beneath the right breast, and nearer the median line than the first. On the 12th a fourth showed itself on the left side of the neck, below the ear.

From the 12th to the 17th of July these eruptions were examined every day, and their progress was attentively followed; the cryptogamic elements which we knew ought to be present were sought for, our search being aided on several occasions by Dr. Rollet; at length, after repeated examinations, we succeeded in clearly recognising the presence of these elements. It was at this stage of the malady that I had the honour of exhibiting this youth to the Society. After this convincing proof as to the nature of the affection, it was decided, in concert with M. Rollet, that M. Mahérault should be submitted to an antiparasitic treatment. Every day all the diseased places—even those on the mastoid region, which had been cauterised on the 13th with solid nitrate of silver—were to be dressed with the following liniment:

Corrosive sublimate . . .	50 centigrammes.
Glycerine	50 grammes.
Alcohol q. s.	

The characteristics and progress of the disease were as follows:

Everywhere it commenced in the same way by a round,

red, but not painful pimple (*bouton*), which itched a good deal, and was about the size of a grain of wheat; it had all the characters of a somewhat large papule, and might have been taken for one of those nondescript pimples, without any pathological signification, that are termed "heat lumps" (*boutons de chaleur*).

The succeeding days the elevation of this pimple above the surrounding skin sensibly diminished, but the redness extended; and instead of a papule there was a small erythematous patch, as large as a five-franc gold piece, of a bright red colour, circular in outline, very slightly raised above the healthy parts, and very pruriginous, but not yielding any discharge.

Gradually this patch increased in size, attaining the dimensions of a gold ten-franc piece, then a silver franc: which latter it even finally exceeded. At the same time the circular form of the lesion became altered; the centre grew a little pale, but the periphery preserved a very marked bright-red tint, and on the border was a circle of very small transparent vesicles, filled with a limpid serosity; these vesicles were easily broken, when their contents escaped and dried in the form of yellow crusts. At the surface of these patches there was not the least appearance of those little depressions like miniature cups which I had observed in my own case, but only some epidermic *débris* that became detached in somewhat large yellow scales.

Such was the state of the disease on the 19th of July.

A microscopical examination of the crusts or *débris* removed from the surface of the patches was made every day. For some time nothing but the remains of the epidermis and some leucocytes were noted; but, finally, after several attempts, especially on the 14th, 15th, and 17th, the elements were found, which left no doubt as to the parasitic nature of the malady. Sometimes well-formed, round, or slightly elliptical spores were noticed; at other times spores articulated end to end, in the form of chaplets; and now and then easily recognisable mycelium tubes. A comparison of these various elements with those derived from the well-authenticated favi of the mice and the rabbit, dispelled all doubts as to their identity, and enabled me, without the slightest hesitation, to consider the eruption observed on M. Mahérault as parasitic in its nature, and caused by the vegetating of the *Achorion Schönleinii*. It must be mentioned, however, that these characteristic elements were not abundant in this instance, and were mixed with a very large number of epithelial cells and leucocytes, which rendered observation difficult;

also that, in certain preparations, we have often been obliged to look for these cryptogamic elements for several hours before finding them in sufficient quantity to dispel the idea of an optical illusion. But we have so frequently repeated these searches, and exercised them with so much care, that it was impossible to entertain the slightest doubt as to their signification.

Otherwise, this disease was not serious in its consequences. Submitted, from the 19th of July, to the local treatment indicated above, M. Mahérault was completely cured on the 1st of August.

2. Some days before M. Mahérault—on the 5th of July—another of our students, M. Guizol, also in the third year of his studies, showed me a small red patch, irregularly circular and dry, seated on the right arm, a little above the elbow, and only offering on its surface some epithelial scales, which were easily removed in the form of little silvery pellicles; this he had noticed for three days. Not yet perceiving in the lesion any very distinct characters, I advised him to wait for a day or two before resorting to treatment.

On the 9th he showed it to me again; it was perceptibly larger, being about the size of a franc; in shape it was a little ellipsoid; it was not painful, but very pruriginous. Its centre was slightly pallid, while its circumference looked very red and irritated. In addition, it was bordered by a non-continuous circle of very small, transparent vesicles, containing a limpid serosity. On the surface of the lesion there were five or six sharply-defined points, the size of a pin's head, slightly buried, *drier* than the surrounding parts, of a *yellow* colour, and showing in their centre a depression comparable to that which might be made by the point of a pin in a firm, but not hard crust. One of these yellow points, removed by a dissection needle, looked flat, and even a little depressed on its free surface; in shape it was round, and its adherent face was somewhat conical. Squeezed on the glass slide and damped by a drop of distilled water, in order to be examined in the microscope, this little *yellow body* distinctly exhibited a very large number of spores, sporophorous tubes, and filaments of mycelium, exactly like those of the *Achorion Schönleinii*, which I have had occasion to observe for so many years.

There was, then, no reason to hesitate; it was *favus* with with which the student was affected, and the disease was manifested in him, as in M. Mahérault and myself, as if it were *Herpes circinnatus*.

I prescribed the sublimate-liniment treatment, and the same

day sent him with M. Mahérault to Dr. Rollet, who, after an examination, confirmed my diagnosis, and approved of the treatment.

How did M. Guizol receive the disease? He had never been specially employed about the diseased animals; though he had certainly seen and touched either the rabbits or the experimental dog, like his comrades, but not frequently. I did not believe—neither did he—that he got the malady in this way. But I have said already that we were infested with mice, the majority of which were infected with this disease, and that they frequented the students' rooms. I may add that in No. 9 room, inhabited by M. Guizol, several were captured; that more particularly on the 17th of July one of these mice, very diseased, was found by M. Herbet, room-companion of M. Guizol, among his clothes and body linen in his closet; and that it was taken alive (see the paragraph relative to Tinea in the mouse).

I am therefore convinced that it was these diseased mice which had deposited, either in the clothes or the bed of this student, the germs of the *Achorion* that vegetated so freely on his arm. However this may be, the malady also in this instance readily yielded to the treatment employed; though it was more obstinate than with M. Mahérault, and even at first extended slightly. It finally disappeared, and on the 4th of August there only remained some pimples scattered here and there on a surface as large as a five-franc silver piece, and it was impossible to find the slightest trace of the cryptogam. As a precautionary measure, however, the liniment was applied for some days after this period.

3. On July 23rd, 1869, another of our pupils, M. Bourotte, a fourth year student, came to me to ask advice regarding a herpetic patch he had on the lower aspect of the right arm, about a decimètre above the humero-radial articulation. He told me he had noticed it for from fifteen to eighteen days, and it had commenced by a small red and very pruriginous pimple, the size of a lentil, which was succeeded by a little red patch that gradually extended and would not heal. M. Bourotte would probably not have cared about this *bobo*, if his attention had not been roused by the appearance of a disease in his two comrades which attracted a certain amount of interest.

The symptoms noticeable at this moment were the following:—An erythematous patch about the size of a franc piece, exactly circular, slightly raised in relief above the healthy parts, of a bright red colour,—especially towards its borders, where there can be plainly seen a ring of serous vesicles, some

intact, others broken, with their serosity dried in small yellow crusts. In a purely anatomical point of view, it is a type of *Herpes circinnatus*. But in examining this erythematous spot more closely, there are observed five or six distinct points the size of a pin's head, resulting from the accumulation of a special yellow matter at the base of each hair, which gives to these points the appearance of a veritable *favus cup in miniature*, in every particular similar to those which I watched and studied so carefully on myself at the commencement of this year.

I detached one of the yellow points with a dissection needle, spread it conveniently on a glass slide, and examined it in the microscope; and at the first glance I lighted upon a spot where was seen a quantity of elements whose nature was not doubtful, for they were the elements of the *Achorion Schönleinii:* spores, sporophorous tubes, and mycelium mixed up in large numbers and sharply defined.

The same day I sent this student to M. Rollet, whose examination confirmed in every particular the above diagnosis.

Where and how had M. Bourotte acquired his malady? This was a question less easily answered than in either of the other two cases. He had examined, studied, and handled the diseased rabbits several times, as well as the young rabbit that I had inoculated; on the other hand, the rooms tenanted by the fourth year students were certainly as much haunted by diseased mice as those of the third year. It was no doubt from one of these sources that he had received the germs of the affection from which he was suffering, but it was impossible to decide which.

There could be no hesitation, however, as to the *true nature* of the disease, and this was the capital point in the matter: it was the result of the germination on the human skin of the spores of the *Achorion* detached from the skin of an animal—rabbit or mouse; and, as with his comrades, this disease presented in him all the characteristics of *Herpes circinnatus*.

M. Bourotte was from this time submitted to the same treatment as his co-disciples.

On July 27th the disease had made no progress; the patch was still very red, especially on its borders, but it had not extended, and the centre was a little paler. The same treatment was continued, only instead of three applications a day, only one was made.

August 1st.—The disease is disappearing. I recommended M. Bourotte to change the dressings for a solution of nitrate of silver to be applied twice a day.

August 4th.—The cure is nearly complete. M. Bourotte having received his diploma at the last examinations, left the College; but I advised him to continue the same treatment for some days.

Such are the new facts that I have acquired during this year on Tinea in animals, and its transmissibility to the human species. They appear to be of great importance, as they in fact prove that the parasitic maladies of animals may be transmitted to mankind with much facility; they throw a new light not only on the history of *favus*, but also on that of *Herpes circinnatus*, the etiology of which is so often obscure and doubtful; and they open, if I am not deceived, a new field for the investigations of science, and seem to me, for all these reasons, to be worthy of the most serious attention of medical and scientific men.

I have said that the *favus* of animals can be readily transmitted to man, and the three facts cited in detail evidently prove this; I ought to add, however, that this transmission is not equally easy in all individuals, even for those placed in apparently exactly similar conditions. Thus, all our students were certainly as much exposed to receive it as M. M. Bourotte and Guizol (I omit mention of M. Mahérault, who was placed in exceptionably favorable conditions for contagion); all should have been equally exposed to receive on their bodies the favus dust derived from the mice which haunted the establishment, and yet up to this time only two out of 168 students have been infected.

Besides this, it is to be remembered that I myself contracted an *Achorial* (if I may employ such a word) *herpes circinnatus*, through touching young dogs to which I had experimentally given the disease. Well, one of our students, M. Meunier, now diplomated, was specially charged with looking after these animals; he examined them every day, handled them for hours together, followed, with much interest and zeal, for me and with me these experiments, and was certainly much more exposed to the contagion than I was; and yet he never experienced the slightest accident in consequence of this contact, although, as I frequently observed, he never thought of taking any great precautions to preserve himself.

Therefore, in order that the parasitic maladies may be communicated, it is not always sufficient that the spores only are transported from the diseased to the healthy individual; it is also necessary that the germs should find in the creature who receives this dust a soil convenient and propitious to its germination.

What are, then, the individual conditions favorable to the

parasitical contagion? I have alluded to one of these in my preceding studies: this is the youth of the contaminated subject; but the new facts that I now publish prove that there are also others which are perfectly unknown, and which should be discovered. On this side, again, there is a fine field opened to the investigations of science.

I have now arrived at the termination of the task which I proposed to myself, and must stop. But I cannot lay down my pen without expressing to M. Rollet all the gratitude I feel towards him for the extreme kindness with which he willingly examined the patients I took the liberty of sending to him, and for the interesting note on this subject which he sent me, and which I think it my duty to reproduce here.

V.—*Note from Dr. Rollet.*

"My dear Colleague,—You have kindly submitted for my inspection three patients affected with cutaneous eruptions of a doubtful nature, and have asked me for my opinion.

"The first patient, M. Mahérault, had on the inside of the left thigh an erythemato-vesicular round patch, about the size of a franc; two similar patches existed in front of the chest, one above, the other below the right breast. There was another, a little smaller, on the mastoid region, near the left ear. These patches were simply erythematous in the centre, where there were some thin crusts and epithelial scales in process of desquamation; around their circumference, however, they were vesiculous. One of the vesicles was yet intact, but the others were broken and emptied of their contents, though perfectly recognisable; all formed a raised border around the eruption, and some of the smallest were the size of a millet seed.

"The second patient, M. Guizol, had an eruptive patch similar to the preceding, though larger, and situated on the anterior part of the right arm.

"The third, M. Bourotte, also had a patch of *Herpes circinnatus* the size of a franc on the anterior part of his right arm.

"In these three patients the eruption occupied parts of the skin provided with hairs, some of which, however, had only the characters of slight down. I thought it necessary to discover, either in the crusts or the epidermic scales of the eruption, or in the hairs implanted in the diseased parts, if the affection was a simple one, or if it was parasitical.

"The hairs did not appear altered, probably because the disease was recent, and had not yet attained its full development. Nevertheless, in one of the patients, M. Bourotte, there could be perceived with the naked eye, around several of the hairs, a little ring of yellow matter having the same aspect as the favus cups.

"It was in this patient that I most readily discovered, by a microscopical examination, the parasitic elements of the affection. Indeed, in the three patients, an examination of the products scraped from the surface of the eruption has enabled me to ascertain, in the midst of various elements (epidermic cells, pus globules, inflammatory globules, &c.), the presence of veritable spores. These spores, which you have also observed, were those of the *Achorion*, so that there could be no doubt as to the nature of the malady: the *Herpes circinnatus* in all the cases was nothing else than a parasitical eruption.

"The parasite was that of *favus*, and, to sum up all, it was favus of the skin which the three patients had.

"This is, then, my dear colleague, the *résumé* of my examination; make use of this note as you think fit, and receive the assurance of my sincere affection.

"ROLLET.

"Lyons, August 4th, 1869."

(*To be continued.*)

CENTRAL VETERINARY MEDICAL SOCIETY.

(OFFICIAL,)

ON Thursday evening, February 8th, the usual monthly meeting of the above Society was held at the rooms of the Royal Veterinary College, G. Fleming, Esq., F.R.G.S., President in the chair.

The minutes of the previous meeting having been read and confirmed, the President laid before the Society a specimen of aneurism which had been forwarded by Mr. A. J. Owles, Staff Veterinary Surgeon, Aldershot. The aneurismal vessel consisted of a portion of the pulmonary artery of a horse which had suffered from typhoid pneumonia. The aneurism existed at about five inches from the heart. The layers of lymph in its interior were only partially organised. An animated discussion followed, after which Mr. Cox moved a vote of thanks to Mr. Owles for his

kindness in forwarding so interesting a specimen; this was seconded by Mr. F. Mavor, and carried unanimously.

The President, and Mr. J. Woodger, jun., each produced a section of a foot of an animal which had suffered from laminitis.

Mr. J. Woodger, jun., also laid upon the table a specimen of strangulated rectum, resulting from a small tumour in the mesentery.

After the production of these specimens, the President offered a few remarks upon parturition in the bitch, and spoke of the great trouble that frequently occurred with young bitches in their first delivery, from the circumstance of their usually giving birth to only a few pups, and in many cases one of them was often very large. The President illustrated his remarks by a drawing representing some instruments invented by two Belgian veterinary surgeons for the purpose of assisting delivery. These instruments he strongly advocated the use of.

Mr. J. Woodger, jun., stated that he had been accustomed to use for some few years a similar instrument to one of those represented in the drawing.

Mr. Cox recommended the use of a warm bath when once a hold of a pup had been obtained, and stated that in several cases he had found the delivery materially facilitated by its use.

The President next said that he had much pleasure in placing upon the table a parcel of books, the gift of Mr. Moore to the Society.

It was proposed by *Mr. Rowe, jun.*, and seconded by *Mr. J. Woodger, jun.*, that a vote of thanks be accorded to Mr. Moore, which was carried unanimously. The meeting then closed. Twenty-one Fellows were present.

(Signed) Joseph Woodger, jun.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The annual meeting and dinner were held at the "Queen's Hotel," Leeds, on Friday the 26th January. The President, Mr. John Cuthbert, in the chair. The following members were also present, viz. Messrs. Naylor, Nicholson, Edmundson, Carter, Fallding, Faulkner, jun., James Freeman; Joseph Freeman; W. G. Schofield; Fearnley, Ferguson, and the Secretary. Mr. Thomas Shaw, of Dewsbury, was unanimously elected a member, and apologies for non-attendance were received from Messrs. B.

Cartledge, President of the R.C.V.S. ; G. Morgan, Dray, Chas. Secker ; Messrs. Taggart, Fryer, J. W. Anderton, Patterson, Schofield, jun., Pratt, Bale, Freeman, jun., Taylor, Walker, Smith, Thos. Greaves, and Professor Williams.

The Secretary read a communication he had received from the Secretary of the North of England Society, desiring to know the opinion of the members upon four questions relating to veterinary politics. After a little discussion a motion was proposed by *Mr. Faulkner*, and seconded by *Mr. Nicholson*, as follows : "That the four questions be discussed at the April meeting, each member being furnished by circular with a copy of the questions."—Carried.

The President expressed his great regret at the death of his College tutor, Professor Spooner, and thought that the members of the Society should express their sentiments at the severe loss which the profession had sustained. After a little discussion it was unanimously resolved, upon the motion of *Mr. Naylor*, seconded by *Mr. Faulkner*, "That the President and Secretary be empowered to draw up a letter of condolence to Mrs. Spooner and family, and forward the same without delay.

The President then delivered his inaugural address, paying a just tribute of esteem and respect to the memory of the late Professor Spooner, and thought that he was the best lecturer that he had ever listened to, he having such a happy way of impressing his remarks upon the minds of the students. The President next adverted to the large amount of good which the members of the profession had received by the formation of veterinary societies, and trusted that their means of usefulness would be still more developed. He then referred to the rapid strides which were being made in pathological knowledge, instancing subcutaneous injection of medicine and the use of the thermometer as proofs of this advancement. He concluded his address by expressing a hope that the members would endeavour to keep their pathological knowledge up to that of modern times.

The Secretary proposed, and *Mr. Naylor* seconded, a unanimous vote of thanks to the President for his excellent inaugural address.—Carried.

A discussion then ensued upon the question as to "whether infection can be carried in the air solely, or what other means of transmission are in existence." Messrs. Naylor, Fearnley, James and Joseph Freeman, Faulkner, Carter, Nicholson, and Ferguson, took part in the debate, which not being concluded was adjourned to the next meeting.

Mr. Fearnley will introduce a paper for discussion at the next meeting.

At the dinner the usual loyal and patriotic toasts were heartily

responded to, followed by a number of toasts relating to the profession, the members separating after enjoying a profitable and happy reunion.

WM. BROUGHTON, *Hon. Sec.*

THE LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting was held at the "Spread Eagle Hotel," Manchester, December 13th, 1871, the President, W. Whittle, Esq., in the chair.

The following gentlemen were also present:—Messrs. John Lawson, T. Greaves, T. Hopkin (Manchester), J. E. Mather (Harperley), Woolner (Heywood), J. B. Taylor (Ashton), A. Lawson, A. Challinor, J. Lowe (Bolton), J. Lomas (Stockport), W. Woods (Wigan), J. Taylor (Oldham), W. Dorber, jun. (Pendleton), Leather, jun. (Liverpool), and the Secretary.

After the minutes of the previous meeting had been read and confirmed, Mr. J. W. Hill (Wolverhampton), and Mr. W. Dorber, jun., were elected members.

A communication from Mr. W. A. Cartwright, of Whitchurch, was then read. It contained an account of a vaginal polypus in a cow operated upon by means of a copper wire ligature. The tumour, which was pendant from the vagina, was pear-shaped in form, about nine inches in length and five inches across its centre, having an uneven surface. The ligature was applied around the neck of the polypus, and on the fifth day was tightened. Three days after this the tumour was excised close to the ligature, and the remaining parts were returned. The cow afterwards did well.

It being the last meeting in 1871, the election of officers for the forthcoming year was then proceeded with. The following gentlemen were elected:—President, A Lawson, Esq. (Bolton); Vice-Presidents, Messrs. Whittle (Worsley), J. Taylor (Oldham), W. Woods (Wigan); Treasurer, Mr. T. Hopkin (Manchester); Hon. Secretary, W. Augustus Taylor (re-elected).

Votes of thanks were cordially awarded the retiring officers for their services during the past year; and a vote of thanks was also passed to Mr. Cartwright for his kind communication.

W. AUGUSTUS TAYLOR, *Hon. Sec.*

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

The first quarterly meeting of the association for the year 1872 was held at the "Athole Arms Hotel," Dundas Street, Glasgow, on Wednesday the 24th January, at 2 o'clock.

Present — Professor Williams; Messrs. Anderson, Sharp, Brownlie, Kerr, Prentice, Stewart, Blackie, and D. M'Lean.

Professor Williams proposed Mr. D. M'Lean as President for the ensuing year. The proposition was seconded by *Mr. Anderson*, and carried unanimously.

Messrs. Kerr and Pollock were elected Vice-Presidents, and Mr. Prentice, Treasurer; Mr. James Anderson was re-elected Secretary.

Messrs. Watson, of Douglas, Walker, of Down, and Neil, of Alexandria, were proposed and elected as Members of the Association.

Professor Williams then gave a most elaborate account of his views of the pathology of *Navicularthritis*. He was of opinion that this peculiar lameness was due to disease of the os navicular, and that the tendon was not primarily affected, as some practitioners maintain. The professor produced a number of specimens in support of this theory of the origin of the disease being based on practical observations.

He also alluded to some specimens of porcelainous deposit in joints, and thought that the diagnostic symptom of the affection was a peculiar cracking of the joints on being moved. The affection appeared to hold some resemblance to rheumatic inflammation of joints.

Mr. Kerr described a case of fracture of the navicular bone in a hind foot caused by violent stamping in the stable.

Mr. Anderson related cases of fracture of the pastern and navicular bones, of *fragilitus ossium*, and of caries of the ribs, producing disease of the lungs, also disease of the shoulder-joint. He likewise drew attention to mesenteric abscesses as the result of strangles, and remarked that the patients invariably rested on their knees.

Professor Williams described a case where a tumour enveloped the liver, weighing 236 lbs. To ordinary vision it resembled cancerous deposit; but on examination by microscope it was found to be nothing more than a mass of fat. The fat-cells were well developed.

James Anderson, *Hon. Sec.*

NORTH OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

The fourth annual meeting of this association was held in the Mechanics' Hall Buildings, Aberdeen, on Saturday, the 6th January, 1872, when a fair number of members were present.

Mr. Hay, Elton, the President, in the Chair.

The minutes of the previous meeting having been read and confirmed, the Chairman called on Mr. Thomson, the treasurer, to read the annual financial report, which was approved, and considered by all present to be satisfactory.

The Chairman then intimated that the election of office-bearers for the year should take place, when it was proposed by *Mr. Neil Barrow,* Turriff, and seconded by *Mr. Mellis,* Inverurie, "that Mr. Keith, Strichen, be elected Vice-President." (Carried.)

It was also proposed by *Mr. Cassie,* Newmachar, and seconded by *Mr. Diack,* Oldmeldrum, "that Messrs. Thomson (treasurer), and Mellis (secretary), be re-elected. (Agreed to.)

It was also unanimously agreed that the whole of the council be re-elected, viz. Messrs. Deuchars (Cruden), Masson (Kintore). Duncan (Methtic), Fowlie (Peterhead), Robbie (Banchory), and Keith (Strichen).

Mr. Hay, the retiring President, in an appropriate speech, addressed the association, referring to incidents affecting the veterinary profession, the state of the country with regard to contagious and infectious diseases, and the steps Government had taken to rid the country of such.

He then called on Mr. Cassie to take the chair as President of the association.

Mr. Hay retired amidst applause, the Association thanking him for his services.

Mr. Cassie then came forward and delivered the following address:—I need not tell you that two of the primary objects of this Association are, the social elevation of its members, and the diffusion of knowledge among them. That both are desirable objects, I suppose, no one will deny; and with a view to the promotion of them I mean to devote the few remarks I am about to make. In seeking to advance the former, some look to Parliament and other external means for help, but, to my mind, elevation by these means would be neither real nor permanent. Our own industry and perseverance can, I think, alone make the profession what it should be. As a body, we must try to elevate ourselves,

and to make the trial successful we must take care that in all our movements we comport ourselves as men of honour, and scrupulously avoid those degrading habits and low tricks sometimes practised by members of our profession. In addition to these, if we are to succeed in such an object, we must all, by every means within our reach, seek to attain a thorough knowledge of our science. The want of this knowledge tends seriously to keep us low in social rank, while the possession of it would act as a powerful lever to raise us. The students that attend the different schools which in this country teach our science are now yearly, it is said, subjected to more searching tests before licenses are given them to practise in it. This is so far right, and will do good; but the best students obtain only half their education at college, the other half they must pick up in the school of experience, as they pursue their daily practice. The teachings of colleges give only capacity for future action, and it is only in proportion as the powers gained at such colleges are industriously worked that the students afterwards become distinguished practitioners. Without industry and perseverance it is seldom that eminence is reached in any line of life. Our profession affords no exception to this rule. Skill in it will not accumulate without labour; yea, abundance of it both physical and mental is often required to enable us to apply the knowledge we may have acquired aright. This, however, we must not grudge, as it generally gives a rich reward. It may sometimes happen that the skill we have is not appreciated; owners will occasionally call in amateurs in our art instead of us to treat their sick stock. At this, however, we need not repine; to keep our skill will cost us nothing; rather let us collect and store it as cash in our banks; for a time will come when all we can gather will be required, and then our stock must not be found wanting. It is only by the possession of superior skill and better application that we can beat nonprofessionals out of the field, and show that we are to be preferred before them. Real worth generally comes to be estimated at its true value. It is probably in some measure because we have hitherto been worth but little that a higher value has not been set on us. Is there not much regarding many diseases our patients are subject to that some of us do not understand, and consequently are all but powerless to treat? How little can the best in our profession do with glanders in horses, quarter ill in cattle, and pox in sheep. By it these diseases are admitted to be beyond the power of cure. It is because of our own ignorance that such an admission has to be made. To cure them is possible did we only know the way. Human thought and observation have already done much in medicine, and in these complaints who can tell what may not be accomplished by continued application? The science of medicine

is capable of a much further development than it has yet reached. The mysterious principle of life, as it operates both in health and disease in the various organs of animals, is yet in many instances but imperfectly understood. The influences different medicines are capable of exerting in animal organisms when affected by disease still require much study to make them fully known. It is the duty of every one to do all he can to free these points from obscurity and bring them into light. Veterinarians have great facilities for assisting in this; among their patients many diseases operate by the same laws, and are subdued by the same treatment as corresponding ones among men. From inability in our patients intelligibly to express their feelings we are denied certain privileges possessed by those who study and treat diseases among the human race; but against this we enjoy far more liberty with medicine on our patients when sick, while, after death, we have much greater freedom for tracing in them the results of disease. Possessed of these privileges we could and should each be able somewhat to aid in the healing art. We must not always be content to bring up the rear, but learn at times to lead the van of the mixed army as it marches on to fresh conquests in the field of medicine. But some will say that our ranks can furnish none with capacities fit to fill a leader's place, and that, therefore, nothing important need be expected of us. To meet this slight let each and all of us set to work and try to prove that it is not true. Talents, I venture to say, are to be found in our profession which, if wrought, would fairly compare with the best that have ever yet been turned to the study of medicine. The real germ is often hidden in the rough block till labour shows its presence in it. In each of us, even, there may be latent powers that have never yet called into play. Let us search for such, and if we find them, stir them up to do their duty. The real worth of medical science will never be seen till all connected with it do their utmost to set it forth. As compared with those of our gentler brethren, our services may never be valued as they ought. They are often considered to have done well and to have earned a rich reward if they, at any cost of time or money, can only prolong life and alleviate pain, whereas if cures by us are not complete, and that too in a short time and at little cost, we are considered to have done nothing and are grudged a slender fee. Considerations like these, however, must not deter us from doing all we can to forward the common cause. A feeling of satisfaction will reward us for every advance we make which no payment in coin can give. Let us each, then, pursue the work with zeal, and fearlessly make known the results we obtain. By so doing we shall be contributing somewhat to the general good, and also be adopting a most effective means of benefiting ourselves.

After being fairly established in practice veterinary surgeons, from the nature of their business, which often keeps them on duty from early morning till late at night, are apt to get into easy habits and thereby occasionally neglect to give the cases they are called to treat so close attention as they deserve, consequently they often miss the instructions nature's healer could give of illness, and also thwart the assistance it would so freely tend to promote a cure. Physicians of all ranks are but helpers to this healer, and the more closely they study and humour its modes of action the more successful in practice will they be. Like many eyes in one head all should, as it were, be gathering knowledge to one centre and for one end. Associations like ours, when working well, do this on a small scale; important objects are through them exhibited to their members, who, in viewing them from different points, and submitting the appearances they present, may enable all to deduce for the common good a something of which they knew not before. In this way meetings of this kind became useful, more especially when all the members freely speak their minds and make no reserve of what they know. We have all experienced the benefit of an occasional hour's talk with a professional brother, when points of difficulty were freely discussed. Were the meetings of all medical associations always conducted in a similar spirit their benefits would be incalculable. Did our profession act more in the spirit "Union is strength," and seek to concentrate the united powers of its members on the difficulties that surround it, many of them would quickly vanish; better prospects would open up before them, our science would be placed upon a higher platform, while we should rise in social rank, being more fully instructed, more highly respected, and much better paid. (Applause.)

The Chairman then called on Mr. Niel M. Barron to read his paper on the "Diseases of the Udder in Cows."

The essayist first went briefly over the process of secretion and excretion, and then briefly touched on the anatomy and physiology of the mammary glands, after which he described the diseases to which these organs are liable, finishing the group with mammitis, which is perhaps the most important.

TREATMENT OF MAMMITIS.

Most veterinary writers agree in recommending bleeding in this disease as one of the first and principal means of cure, repetition of it as advantageous, and the giving at the very outset of the disease large doses of purgative medicine. My experience is decidedly against these recommendations, and I am somewhat chary of bleeding in any stage of this complaint. When the

large and important organ under consideration is attacked with mammitis, I think the disease proves a powerful divertive or check to the general circulation, hence the peculiar and extreme coldness of the back and quarters, and the laboured action of the heart. The treatment at the outset of this disease, which most quickly restores the balance of the circulation, increases the general heat and tends to excite the stomachs to action, is by far the most preferable. With this object stimulants and carminatives should be given internally and heat applied externally. Repeated doses of carb. ammoniæ, zingib., and caraway seeds, or spirits of ammonia, aromatic, and other stimulants, draughts of strong warm tea, warm water, &c., should be given. Outwardly application should be made of dry heat by ironing the back with the hot smoothing iron, and placing on the loins a bagful of some suitable substance which has been well heated dry on the fire; use also plenty of clothing, or try rugs wrung out of hot water, placed over the animal under dry clothing. If the patient is unable to rise, the hot rugs and hot ironing may be followed up by friction to the loins and quarters, and the use of turpentine or other stimulants. Such treatment seldom fails to restore the balance of the circulation and raise the natural heat, and very frequently excites the stomachs to action. Then, or at any rate not till then, should antiphlogistic measures be adopted, as there is a great tendency to prostration and fatal sinking under their too early or too severe application in this affection. A brisk purgative may now be given, and other febrifuge medicine employed with the free and continued use of carminatives. If there is pain in one or both hind legs these should be fomented freely with warm water, some adonine liniment, and afterwards a stimulating embrocation applied. Local treatment must also be assiduously attended to, consisting of warm fomentations to the udder, very continuous friction by the hands, a liniment of camphorated oil, Tr. opii, Tr. ac., with perhaps a little turpentine in it, and frequent drawing of the teats. In a mild case, where only one quarter is affected, steady perseverance with these local measures, combined with judicious general treatment, will usually produce a return to health both of the animal and the affected organs in a few days, and also a return of the natural secretion. In more severe cases where several or all the quarters are involved, beyond the systematic remedies already alluded to, diuretics are much required, and may be used from the commencement to assist in removing the extensive effusion, and, further, a suspending bandage may be locally applied with emollient poultices of bran and linseed meal, with decoctions of camomile flowers and warm fomentations; persevering at intervals with the liniment friction and drawing. Instead of this some recommend

cooling lotions such as nitre and common salt dissolved in water, or Goulard's extract of lead, vinegar and water. The teats may be occluded with thick clotted matter, which the occasional use of the teat syphon or silver probe may assist in removing, and thus allow the more liquid portions to escape. At times the coagulum is of such consistence as entirely to plug up the passage, and can neither pass itself nor allow the thinner portions to escape. To remedy this I have heard of cutting off the extremity of the teat, but while this may afford relief to the quarter it precludes the chance of a useful recovery. I have read of a more approved method, that of making a perpendicular incision in the teat, by which the matter may be discharged, and then there will be a chance of the teat healing up and fulfilling its normal function, should the secretion be restored. In all severe cases after the more urgent symptoms have been combated or the case has become chronic, good support is necessary, and the continued use of tonics, stimulants, diuretics, and carminatives should be persevered in.

Such treatment should be gradually withdrawn as renewed appetite and rumination, freedom from pain, reduced swelling, and it may be restored secretion indicate a healthy termination.

The terminations of mammitis are—First, resolution in mild cases. This will sometimes take place in a few days, at other times in a much longer space of time. The inflammatory action subsides and the secretion of milk returns. In other cases, although the disease subsides the quarter of the udder ceases to secrete milk, and we have what is called a blind quarter, and this may be considered the

Second best termination. Again we find the disease assuming an indolent form, requiring the use of external stimuli, and often ending in induration, or the

Third termination. In such a case the use of iodine or iodide of potassium internally, and iodine ointment externally to the parts affected, are amongst the best remedies. Amputation of the organ has been accomplished successfully, thus allowing the animal to be made fit for the butcher.

Fourth, suppuration. This is a very common termination. Under some circumstances the matter can be drawn through the teat, as already referred to; in others, abscesses form in the deep-seated tissues, requiring free incisions, bathing, and the use of digestive ointment.

Fifth, gangrene or mortification. When this takes place large diseased portions of the udder become separated and drop off or fall out, and are sometimes the better to be assisted in their removal.

Sixth, death. This sometimes occurs rather suddenly from the violence of the symptomatic fever induced. But those cases (as already stated), where there is a great tendency to effusion in all the quarters of the udder, with no indications of suspuration, great prostration and entire loss of appetite and rumination are, I think, the most generally if not the most suddenly fatal. I incline to the opinion that very great functional, if not organic, disease of the heart has much to do with the fatality.

Lastly. Although surveying the onset of the disease, the constitution may be at length destroyed and the animal sink, by the continued irritation of the morbid state of the udder, the constant discharge of matter from sinuses which have formed, or fall a prey to other diseases which this has induced.

I trust that these hurredly put together remarks may form the basis of a practical and profitable discussion, which shall in great measure make up for lack of time and ability.

The President complimented Mr. Barron very highly for his excellent paper, and a very free and profitable discussion followed, in which all the members present took part.

It was then arranged that Mr. Robertson (Stonehaven) would bring forward an essay at next meeting.

Votes of thanks having been accorded to the essayist, the meeting adjourned to M'Donald's Hotel, where they partook of an excellent dinner and spent a very agreeable afternoon.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At the monthly meeting of the Society, held February 7th, Sir Watkin W. Wynn, Bart., M.P., President, in the chair, Mr. Milward, chairman of the Stock Prizes Committee, reported "that letters had been read from several persons complaining of malpractices with regard to the exhibition of pigs, and that the committee recommended that the attention of the stewards and judges be called to this subject, and that any person found guilty shall not be allowed to exhibit in future. The committee also recommended the following addition to the rules of the Cardiff prize-sheet :—'No mare will be eligible for a prize unless certified, either at the date of entry, or between the date of entry and that of the show, to have had a living foal,—or that the foal, if dead, was born at its proper time,—in the year of the show. Or in the event of a mare being exhibited without a foal at foot,

a certificate shall be given at the time of entry that she has been served, and the prize shall be withheld till a certificate be produced of her having produced a foal.'—This report was adopted."

HIGHLAND AND AGRICULTURAL SOCIETY.

The monthly meeting of the directors of this Society was held in their chambers, 3 George IV Bridge, Edinburgh, on Wednesday, February 7th. Among other matters, attention was called to the "Contagious Diseases (Animals) Act," and "letters were read from Sir William Forbes of Craigievar, Bart., and Mr. Newell Burnett, sending, by desire of the Local Authority of the county of Aberdeen, a report by their inspector, and expressing a hope that the society will co-operate with them in representing to the Privy Council the necessity of all local authorities throughout the country taking proper precautions to prevent the spread of disease, and that it is indispensable that more efficient provision should be made for the inspection of animals in Ireland. The following excerpts from the report were read:—'Since my report to you on 1st September last, I regret to say that there has been a continued increase of contagious diseases among animals within the county. Since that date there have been sixteen outbreaks of pleuro-pneumonia, and 597 of foot-and-mouth disease. In reviewing the state of disease throughout the county during the year 1871, I find that there have been 866 centres of foot-and-mouth disease, while there were only 150 during the previous year. There have been twenty-five outbreaks of epizootic pleuro-pneumonia, seven of which are, however, reoccurrences of the disease at places preciously reported on. Only four outbreaks occurred during the year 1870; 223 animals have been slaughtered during the year in accordance with the regulations of the Local Authority. It is disappointing to find that, notwithstanding the restrictive measures adopted by the Local Authority, contagious diseases have prevailed so extensively during the past year, but this state of matters is in a great measure due to the increasing practice of importing stock from the south, and consequent importation of disease. During the past year 10,000 animals, consisting mainly of English and Irish stock, with a small proportion of foreign cattle, have been brought to Aberdeen either by rail or steamboat, and have been examined by me. Of this

number 406 have been found suffering more or less from foot-and-mouth disease.' The communications were referred to the Committee on the Transit of Stock."

Veterinary Jurisprudence.

A HORSE WARRANTY CASE.

An Alleged Case of Roaring.

In the Court of Common Pleas, London, on the 6th and 7th February, before Mr. Justice Byles and a Special Jury, the case of "Tattersall and Another *v.* Blagrave" was heard. It was an action upon a cheque of 115 gs. given in payment to Messrs. Tattersall as the price of a horse sold at Lord Combermere's sale in July last. The defendant pleaded that the horse was a "roarer."

Mr. Huddleston, Q.C., and Mr. Petheram appeared for the plaintiffs; and Mr. Digby Seymour, Q.C., and Mr. Padgett for the defendant.

Mr. Huddleston, Q.C., in opening the case, said that Mr. Tattersall and Mr. Pain were the proprietors of the well-known establishment at Knightsbridge, and the defendant is a young gentleman about twenty-four years of age, the son of Mr. Blagrave, Calcot Park, near Reading. On the 15th of July last year Mr. Pain went down to Combermere Abbey to sell the whole of Lord Combermere's horses, excepting three stallions, without reserve. The advertisement stated that they were "on view a week before the sale," and that, the learned counsel stated, implied that the horses were to be sold without warranty, and that all intending purchasers might go and inspect for themselves. The horse in question was described in the catalogue as "Buxton, a chestnut gelding, six years old." Buxton was a favorite horse of Lord Combermere's, and he had had him for three years and ridden him more than any other horse during the hunting season. He was a clever hunter, and was well known to several of Lord Combermere's friends, who would be called as witnesses to prove the soundness in the horse's wind. Buxton was knocked down to Mr. Blagrave, jun., who gave the cheque in question for the 115 gs. The cheque, on being presented, was not paid. Mr. Blagrave then wrote the following letter to Lord Combermere:—"Mr. Blagrave presents his compliments, and is sorry to complain that his son, in the teeth of written instructions to the contrary, purchased a horse at your lordship's

sale." If, said the learned counsel, Mr. Blagrave had given written instructions to his son "to the contrary," he ought to have advertised it, because Messrs. Tattersall could not be expected to say to every young man who had come of age, "I beg your pardon, but have you got your papa's permission to buy?" That was one expedient used by Mr. Blagrave to get rid of his son's bargain; but he went on in the same letter to say:—"The animal Buxton is pronounced by a veterinary surgeon to have a disease of the wind, with roaring, which not only renders the animal unsound, but incapable of performing the duties of a hunter. Under these circumstances Mr. Blagrave would take it as an act of kindness and courtesy if he were permitted to return the horse. If his son had any money of his own he might have to stand by his bargain, but as it is the loss must fall entirely upon the father." On July 31st Mr. Blagrave wrote to Messrs. Tattersall renewing the same suggestion:—"Mr. H. Barry Blagrave purchased a horse for £120 15s. (115 gs.) He found on riding the horse from Reading Station to this place (Calcot Park, a distance of three miles) that he was 'a 'roarer,' and he sent immediately for a veterinary surgeon from Reading, who gave a certificate, and pronounced him a 'roarer,' and consequently incapable of performing his duties as a hunter, as described in the catalogue. I wish to know what is to be done with the animal." Messrs. Tattersall replied to that:—"We are very much surprised at the stopping of your cheque. You will be extremely annoyed if we refuse to take a cheque of yours again. It was not sold as a good hunter, but, as Lord Combermere will prove, the horse is a clever hunter." Then on the 23d of July Mr. Blagrave wrote again to Messrs. Tattersall:—"Since writing you I have received an answer that Lord Combermere declines to take back the horse. As my son has left England for the Continent, I am afraid his lordship will have some difficulty in getting the money. It will be open to you to bring an action against my son, but I give you fair notice that he has no money of his own, and no property in reversion, and nothing will induce me to pay the money for him." Messrs. Tattersall replied:—"Whatever may be the difference between your son and Lord Combermere, we beg to say that as you have thought proper to stop the cheque drawn in our favour, we must proceed against you for the amount." Mr. Blagrave had, therefore, put his son in an awkward position, which might be construed by the legal profession as "obtaining money by false pretences," by representing that he had assets at his banker's to pay a cheque, whereas he had nothing at all. On the 27th July, Mr. Blagrave wrote:—"I did not pretend to say that my son had no money to pay £120 for a horse; but if the verdict of the jury should be against him, in addition to the price of the horse, there will be costs to pay, and I am ignorant of any means he may possess to meet them." Mr. Blagrave sent back the horse to Messrs. Tattersall's with the groom, but Messrs. Tattersall sent it to Batty's, with instructions that it should be kept there for Mr. Blagrave. The horse is still at Batty's. The learned counsel said it was really

an undefended action, for all their pleas were negatived by the correspondence; but he supposed the substantial point taken by the other side would be as to the condition of the horse, and as to this he should call witnesses.

After evidence had been led,

Mr. Digby Seymour, Q.C., addressed the jury. He said the first question was, "Did the catalogue with the name 'hunter' carry with it a condition; and if so, was it broken?" He contended that it meant the definition given to it by Mr. Pain in selling horses, viz., to be "sound in wind and eyes." The learned counsel then went on to say that his witnesses had proved that this horse was an unsound horse, and that as the plaintiff had given a warranty by describing the horse as a "hunter," his client was entitled to the verdict of the jury.

Mr. Huddleston, Q.C., having addressed the jury on behalf of the plaintiffs,

His Lordship commenced to sum up. The material allegation, he said, was that the horse was sold as a good hunter, whereas it was alleged that he was not a good hunter. The real plaintiff in the case was probably Lord Combermere, for Messrs. Tattersall were really only his agents. His lordship having analysed part of the evidence on behalf of the plaintiffs, was interrupted by

A Juryman, who said they were all of one opinion, and would rather not trouble his lordship to sum up the whole of the evidence.

His Lordship said he should only be too glad if the counsel on both sides agreed.

There being an acquiescence on the part of counsel,

The jury at once returned a verdict for the plaintiffs for the £120 15s., and the judge certified for costs of a special jury.—*North British Agriculturist.*

THE 'SPORTING TIMES' AND MR. SPOONER'S WORK ON THE FOOT OF THE HORSE.

ELING HOUSE, ELING, SOUTHAMPTON.

February 12th, 1872.

GENTLEMEN,

In your obituary notice of the late Professor Spooner, and your tribute to his good qualities, in which the profession fully

joins, you allude to the fact, and with some regret, that he published very little during his life. This, however, is very frequently the case with men who are in the habit of delivering almost daily oral lectures. Abernethy, whose lectures I attended, used to keep all his good things for his pupils; and his jokes and illustrations seemed to be carefully tabulated with each portion of the human frame. We can imagine how their raciness and freshness would have been lost by previously passing through the printer's hands. We can hardly wonder, therefore, that lecturers so often shun the press.

In a weekly paper, called the *Sporting Times*, which was put into my hands whilst travelling in a railway carriage some time since, there is a short notice written by a pen evidently dipped in gall, which stated that the late Professor in his younger days wrote a work, or an essay, as the writer calls it, on the 'Foot of the Horse;' and he then proceeds to disparage the work, stating that it consisted of old things hashed up, &c. Now, it is very evident that the writer had never read the essay which he so freely criticised, or he would have seen that it was a book of nearly 400 pages, published in 1840, when the Professor would have been thirty-four years of age, and that its author was not Charles Spooner, but the writer of this letter. However grievous it may be to incur the censure of the critic in question, I must console myself with the knowledge, which the enclosure will prove, that this was not the opinion of such authorities as the Editors of the *Lancet*, *The British and Foreign Medical Review*, *The Sportsman*, *The New Sporting Magazine*, as well as the *Veterinarian;* and as in those days it was the custom to read works before reviewing them, I must really give their critiques the preference.

It is rather a singular fact that my namesake and myself were the only persons bearing the name of Spooner on the List of Veterinary Surgeons, and that we were both pupils together, I being, although several years younger, yet his senior at the College; indeed, I perfectly remember his first entrance into the College gates, and my being informed of the accession of a namesake. Although, like the writer of his obituary, we were friends of very long standing, we have, from our names and pursuits during our respective careers, been often mistaken for each other. I have been often called Professor, and he has been as frequently spoken of as a writer. Well, no great harm has been done, but still it is as well, just for the information of those who may not be aware of them, to state the simple facts. Although for many years past my time and energies, and, I may add, my pen also, have been devoted to other pursuits, yet in the early days of the *Veterinarian*, ere it had been thoroughly established, I had something to do with it, having been occasionally called to the rescue by its *quondam* Editors. There are a few anecdotes of these early days, interesting, perhaps, to the profession alone, that I

could mention, but I fear to be thought garrulous; but I was not willing that the reputation of one of my earliest productions should be, without a protest, even condemned by mistake by a writer who, as far as I am aware, has not, up to the present time, had the decency to apologise for his almost unpardonable blunder.

W. C. SPOONER.

To the Editors of the 'Veterinarian.'

THE FOLLOWING ARE THE CRITIQUES ALLUDED TO IN THE ABOVE COMMUNICATION:

"This work will form a most valuable addition to the library of the Veterinary Surgeon."—*Veterinarian.*

"This is both a practical and very interesting volume, and one which evinces much sound information on the part of its author. The physiology of the foot contains matter of much interest, and is ably and pleasantly written. We feel satisfied that Mr. Spooner's work will be perused with much satisfaction and instruction by unprofessional as well as medical readers, and to both we warmly recommend it."—*Lancet.*

"A capital book, full of admirable matter, put in fashion that suits it to the meanest capacity."—*Sporting Review.*

"This is a very valuable work, and merits the attention, not merely of such members of our body—a vast majority—as are directly interested in the practical part of the subject of which it treats, but also of those who pursue the study of Comparative Pathology as an object of scientific inquiry."—*The British and Foreign Medical Review.*

"The chapters on shoes and shoeing are clear, practical, and to the purpose. Mr. Spooner has not only written a clever but an amusing book."—*Sunday Times.*

"We have perused with some attention and considerable pleasure this truly scientific and very useful work, and a more interesting and instructive publication we have never read. Mr. Spooner always stood deservedly high in his profession, and this standard work must unquestionably add, in no slight degree, to his well-earned fame. The section on Shoeing is not the least worthy of notice: we recommend its perusal to every horse-master. When every page abounds in instructive matter, it is hard to select. We must content ourselves by recommending Mr. Spooner's talented production to every one who rejoices in the possession of a horse, from the costermonger to the peer; for each and every one, from the lowest to the highest in the land, must benefit themselves as well as their stud, by the study of this masterly work."—*Sportsman.*

"We recommend this work to all interested in the subject. Its grasp is copious, and its detail clear and well defined."—*New Sporting Magazine.*

MISCELLANEA.

TRUFFLES.

This esculent grows in a sort of semicircle, something in the same way as mushrooms. They are principally found in plantations of young oaks, and lie just below the surface. In Touraine, and particularly in the neighbourhood of Arc-en-Barrois, they grow in abundance at the foot of fir trees, and sometimes even in gardens. Every year the truffle hunters apply to the proprietors of the woods for permission to exercise their calling. In the Haute-Marne they make use of small dogs trained for the purpose, and in the South, of a peculiar race of pigs. The education of the dogs consists in hiding under the soil a wooden shoe filled with earth, and containing a piece of a truffle and a piece of bacon. The smell of the latter attracts them and causes them to scratch up the shoe to get at the morsel of food. By degrees they confound the two scents, and cannot perceive that of a truffle without thinking of the bacon and digging up the earth. They are rewarded with a piece of bread whenever they discover a layer of truffles. The price of a well-trained dog is about 100f. Sporting dogs are never trained for the purpose, as their instinct would lead them to hunt for game instead of truffles. When the trained dog comes on the scent of the truffle, he stops and begins to scrape up the ground. The hunter then digs with a hoe, and discovers the object of his search, and then, following the track in a semicircle, finds the bed. After having collected all that lie in this semicircle, he turns up the ground, and clears away all the weeds—an operation which is called sowing the truffles. In the South, and particularly in the mountainous neighbourhood of Grasse, the truffles grow in abundance at the foot of the white oak, and there a race of exceedingly lean, lanky pigs are used, called hunting pigs, or pig-greyhounds. These animals show great skill in discovering truffles, which they dig up with their fore feet and snout. When they have once discovered the layer, they relinquish to their master the task of digging, and receive as a reward a few acorns, which they relish more than the underground delicacy.

OBITUARY.

We have to record the death of Mr. James Law, M.R.C.V.S., London, which took place February 15th, ult. His diploma bears date June 20th, 1838.

ERRATUM.

On page 97, line 35, *for* "insufferable," *read* "inseparable."

THE

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Communications and Cases.

QUINTUPLE GESTATION IN THE COW.

By G. Fleming, M.R.C.V.S., Royal Engineers.

The singular case of plurality of fœtuses in a cow, recorded by Mr. Litt, of Shrewsbury, in last month's *Veterinarian*, deserves more than a passing notice, from its great rarity and physiological value. The cow, a uniparous animal like the sheep, not unfrequently gives birth to twins, but there its prolificacy generally ends; whereas the latter animal may bring forth as many as seven perfect lambs at one birth. Certainly, instances are recorded in which the cow has produced three, and even four calves, though these occurrences are so infrequent that it requires much patience to seek for them in the different veterinary periodicals. Having had occasion recently to investigate these cases of multiple gestation in uniparous animals, I was delighted to find Mr. Litt's extraordinary relation, as it increases the number of quintuple gestations in the cow I have been able to gather, after a careful and extensive research, to *two*. The other case is more interesting than that now referred to, inasmuch as the calves were born alive, and lived for some time. In an anatomical point of view, it is a pity Mr. Litt did not inform us as to the position the fœtuses occupied in the uterus, and how the fœtal envelopes were arranged. Perhaps he may yet be able to furnish us with these always valuable details—useful no less to the anatomist, physiologist, and embryologist, than to the *accoucheur*.

The first case mentioned is reported by Professor Giuseppe

Lessona in the *Giornale di Veterinaria* for June, 1855, who had it from Signor Cassina, a veterinary surgeon at Villafranca; the relation is followed by some appropriate remarks by the Professor, and as the case, from its extreme rarity, in addition to these notes, may prove interesting to the readers of this journal, I venture to give a condensed translation.

On the 9th of March, 1855, in the village of Mottura, a cow, aged eighteen years, began to exhibit uneasiness and other signs of approaching parturition about eleven o'clock in the morning. According to the owner of the animal, it was still within twenty days of its full time, and he therefore imagined it would prove to be a case of abortion. S. Cassina, who had been called in, was about to make an examination *per vagina*, when the water-bag appeared, and after some straining the extremities and then the head of a fœtus presented themselves, in a normal position. Some slight traction, combined with the uterine contractions, sufficed to deliver the cow of a living and perfectly developed female calf. During calving the parent had been lying, and after the birth it did not attempt to get up; in a few minutes the straining recommenced, and an entire placenta was discharged. The recumbent position was maintained, and the straining persisted; so that Cassina, taking this sign, together with the large size of the abdomen, into consideration, suspected the existence of another fœtus, and an exploration confirmed his suspicions. In an hour a male calf was born, and in three hours a third—a female, and the mother soon after rejected another placenta more voluminous than the first. Although but little weakened by a continuous labour that had now lasted three hours, the cow drank with avidity; it got up, and the three calves were placed beside it, but it did not care for them. Some hay was given to it, and this it ate almost without mastication. Before long the straining reappeared, and continued at intervals until the evening, when a draught of tepid wine being administered, they became more active, and in a brief space two feet showed themselves outside the vulva, then a head, and finally the body of a male calf as well shaped and vigorous as the others. In a short time, and without any difficulty, there arrived a fifth calf—a female, which was followed by a third complete placenta. The parturition of the last two calves was long and laborious, although they were brought forth in a normal position.

The previous year this cow had produced twins, which were reared; but the same bull had not been employed for this fecundation, but a younger, more perfect, and more robust one. This bull was so prolific, that in one year it

had got several twins in the locality. Its mother had actually reared twins—males—at the same time as this bull.

The five calves just produced weighed about 37½ lbs. each, and were lively and perfectly developed. They only lived eight days, however; for, either in consequence of having calved before its time, or through age, the mammæ of the cow were dry; so they had to be put to another cow, whose milk disagreed with them, and they died of indigestion.

Lessona saw in this case, beyond the multiple gestation, two interesting peculiarities. The first was the development of five fœtuses of the same vigour and volume. He believed that two had occupied the same envelope, and another two another envelope, and that these were lodged in the right and left cornua of the uterus; while the fifth fœtus had a whole placenta and occupied the body of the organ. The last should therefore have been larger, and have offered a serious obstacle to the development of the others, though in reality there was no difference between them. The second peculiarity, which is the most surprising, was the normal anterior presentation of five fœtuses at one birth; experience having demonstrated that, where there are more than two, they are nearly always in a bad position for delivery, or at any rate manifest a tendency to posterior presentation.

With regard to the question so long discussed as to whether the male or female exercised most influence in these multiple conceptions in uniparous animals, Lessona did not think that his own observations were of any great value, as they had been made on animals breeding in a state of liberty, with which even twins are extremely rare; besides, he had lived in a country where it was customary to introduce several bulls into the same herd. It was therefore impossible to state, even approximately, which of these animals was the parent of twins. Nevertheless, the instances he had noted authorised him to assert, so far, that it is to the male that must be attributed the largest share in double conceptions; whether these were due to one or several copulations he could not affirm, though he was convinced that one might fecundate several ova. It would therefore appear that the aptitude to produce the impregnation of more than one ovum is due to the youth and good condition of the male, the female being by parity of circumstances in the same state.

However this may be, it is evident that the cases of twin or multiple gestation in the females of the domesticated animals which are ordinarily uniparous, are so rare as to be only noted in a state of domesticity; the influence of food, shelter, and care increasing the procreative faculties.

Lessona mentions that in the royal domain of Sardinia, among two hundred breeding cows, from 1819 to 1824, there was not a twin birth recorded. The method of rearing was common to the males and females, and being fed with the greatest parsimony, it will be easily understood that the breeding-stock was poor, and its development slow and incomplete. This vicious custom is common to the whole island, so that twin births among cattle are never heard of. In 1824 attempts were made to improve the indigenous breed by changing the system of rearing, but the enterprise was not easily accomplished, for two reasons: the first of which was the difficulty in choosing animals, all being very inferior; and the second the very serious obstacles offered through the bad notions contracted from infancy by the cowherds. In these circumstances Lessona proposed to the superior administration that the indigenous should be crossed with the Piedmontese breed. A herd of cows was to be formed, in which some bulls of the best Continental race were to be introduced. In 1825 there arrived fifteen cows and seven bulls, but the latter were too old and tall for the cows. Only one bull, the youngest, was put to the Piedmontese cows which were not in calf; the others were castrated, as the fatigue and constraint they experienced during their voyage had made them ferocious.

It happened that the Piedmontese cows produced four male calves, and these were reared by Lessona with much care. At two years they were put with some of the least ungainly cows of the native race. In the following spring, out of ninety-seven of these cows, two had twins.

These bulls had received, for eight months, all the milk furnished by their mothers, and they had afterwards been fed on mixed food until the moment when they were introduced among the cows. This same method of coupling and breeding was continued until 1824, with the breeding stock of the pure Piedmontese race; at this period there was a breed of cattle which left nothing to be desired, every year witnessing cows bringing forth twins.

Observations made in another royal establishment which followed the same system, and which possessed more than five hundred cows, still further convinced Lessona of the influence a well-conditioned bull exercises on the frequency of geminous births when it has been suckled for a long time.

In 1849 a young bull—nine months old—was purchased by the Royal School; it continued to suck for some time after this, and at two years old was in magnificent condition. It was put to thirty-seven cows outside the school, and among

these five had twins while of seven, which it had fecundated, and which had belonged to the establishment, two had also twins—one two males, the other two females. All these cows had been kept in the same way. In the third and fourth year of this bull, it fecundated a similar number of cows, but there were no more twins.

Lessona believed that trustworthy statistics relative to the annual number of twins produced in the bovine species, would demonstrate that these instances are common in the provinces, where intelligent breeders are alive to the advantages agriculture may derive from perfecting the breeds of cattle; and that it may be laid down as a rule that when the most perfect cow in a herd—one which gives the largest quantity of milk, brings forth a male calf, the latter should not be allowed to act as a breeder unless it had been suckled for a whole year.

THE TRANSMISSIBILITY OF TINEA TONSURANS FROM THE LOWER ANIMALS TO MANKIND.

By G. Fleming, M.R.C.V.S., Royal Engineers.

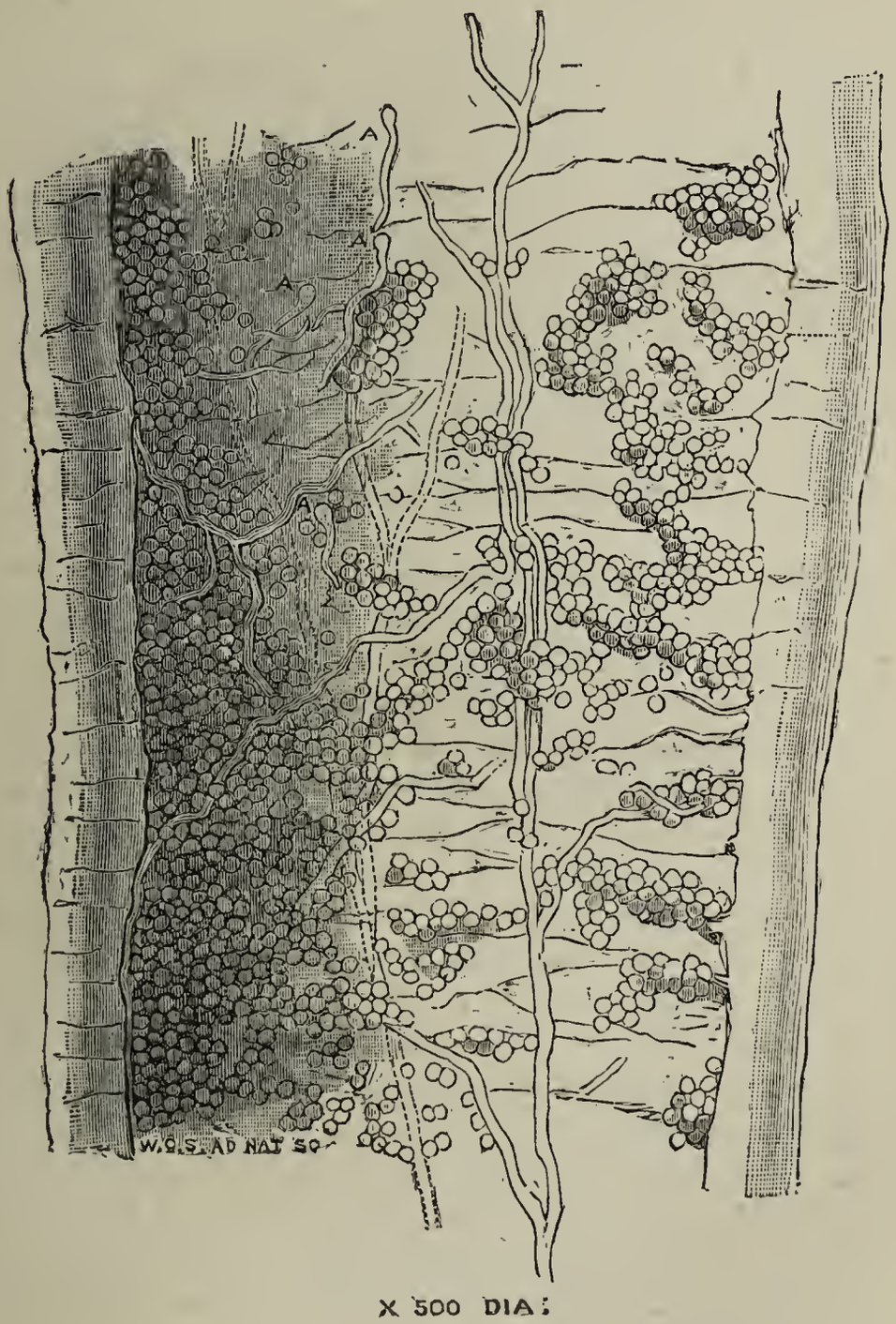
Through the courtesy and kind thoughtfulness of Dr. Tilbury Fox, I have been favoured with a copy, from the 'Clinical Society's Reports,' of a notice of some cases of tinea circinata in man, which was proved to have been communicated to them from a horse. As we shall observe hereafter, there is no absolute novelty in such transmission of the disease; but the Doctor, with that ability and discrimination which have constituted him so eminent an authority among dermatologists, has presented the history of the occurrence so concisely and clearly to the medical public, and has, in addition, enhanced its value by some most judicious and rather novel observations, as to render it deserving the particular attention of comparative pathologists, the malady being by no means an uncommon one in the lower animals.

It appears that not long ago a medical friend brought to Dr. Fox a coachman and a groom affected with tinea circinata (ringworm of the body) in an exaggerated form, the affection being more particularly localised about the backs of the fingers, the hands, and the front and outside of the forearms. The patches were numerous: there were a dozen or more on the arms and hands of each of the men, and a third groom was similarly affected. Both arms were alike involved. The

largest patch was about the size of the top of an ordinary wineglass, the smallest that of a shilling. The patches were more raised than usual, and there was also a greater amount of infiltration, more scaliness, and vesiculation; while some of the places on the back of the hand were dotted over with minute pustules. These differences Dr. Fox attributed to the skin having been more irritated than is usual in this disease: a larger sowing of fungus of vigorous growth no doubt accounted for the increased amount of irritation. On examining the scales from patches about the wrist, fungus elements possessing the characters of the tricophyton tonsurans were at once detected.

Dr. Fox was informed that the gentleman in whose service the men were employed had sent to the Veterinary College (London) a white pony, which had suddenly become infected with an herpetic disease; and it was believed that the men had "taken" their malady from this animal. The pony was observed to be the subject of an eruption about December 10th; the coachman, who, with the other men, groomed the animal, noticed the "herpetic" spots on his lip and wrist on January 15th; the other two men being affected about the same time. On visiting the creature at the Veterinary College, Dr. Fox found its body covered all over with discoloured spots of a fairly circular outline, varying in dimensions from that of a shilling to large irregular patches the size of the palm of the hand, or more. These latter were formed, doubtless, by the rapid spread of the affection over a wide surface, and the coalescing of the patches. The appearance presented was as though circular pieces of mud had been scattered all over the white coat of the pony, and then brushed off, leaving the hair over the circular areas with which it had come into contact of a dirty white hue, which contrasted strongly with the clear white of the intermediate portions of the coat. But on looking closely to the discoloured patches, it was at once evident that the hairs themselves had become altered in texture and direction. They were curled and bent out of their proper course into wholly different directions. They were also loosened, and readily came away from the follicles, while some broke off; besides, they were more opaque, and the surface of the skin was covered over by a mealy powder, thickly set about the hairs. The pony was in very poor condition generally, and its skin presented all the characters of tinea tonsurans, or ringworm of the hairy scalp of man. On microscopical examination a large amount of fungus was discovered of the same kind, and in the same positions, as in tinea tonsurans: that is to say, the epithelial cells, the hair

sheath, the root of the hair, as well as its shaft, were all invaded by the sporules of the trichophyton. One of the hairs placed in the microscope showed its root ensheathed in a mass of sporules of an average size of ·0012 inch in diameter; these were also seen in the interior of the hair shaft, along with mycelial threads. There was likewise a fair amount of mycelium of a very luxuriant kind around the shaft, especially at the upper part of the follicle, to which the air would first have access. The accompanying illustration (for which, with the second one, I am indebted to Dr. Fox) shows the fungus in its mycelial and sporular form invading a portion of the shaft of one of the hairs: A, A, A, are germinating spores.



X 500 DIA:

Dr. Fox learned that several horses in the stables from

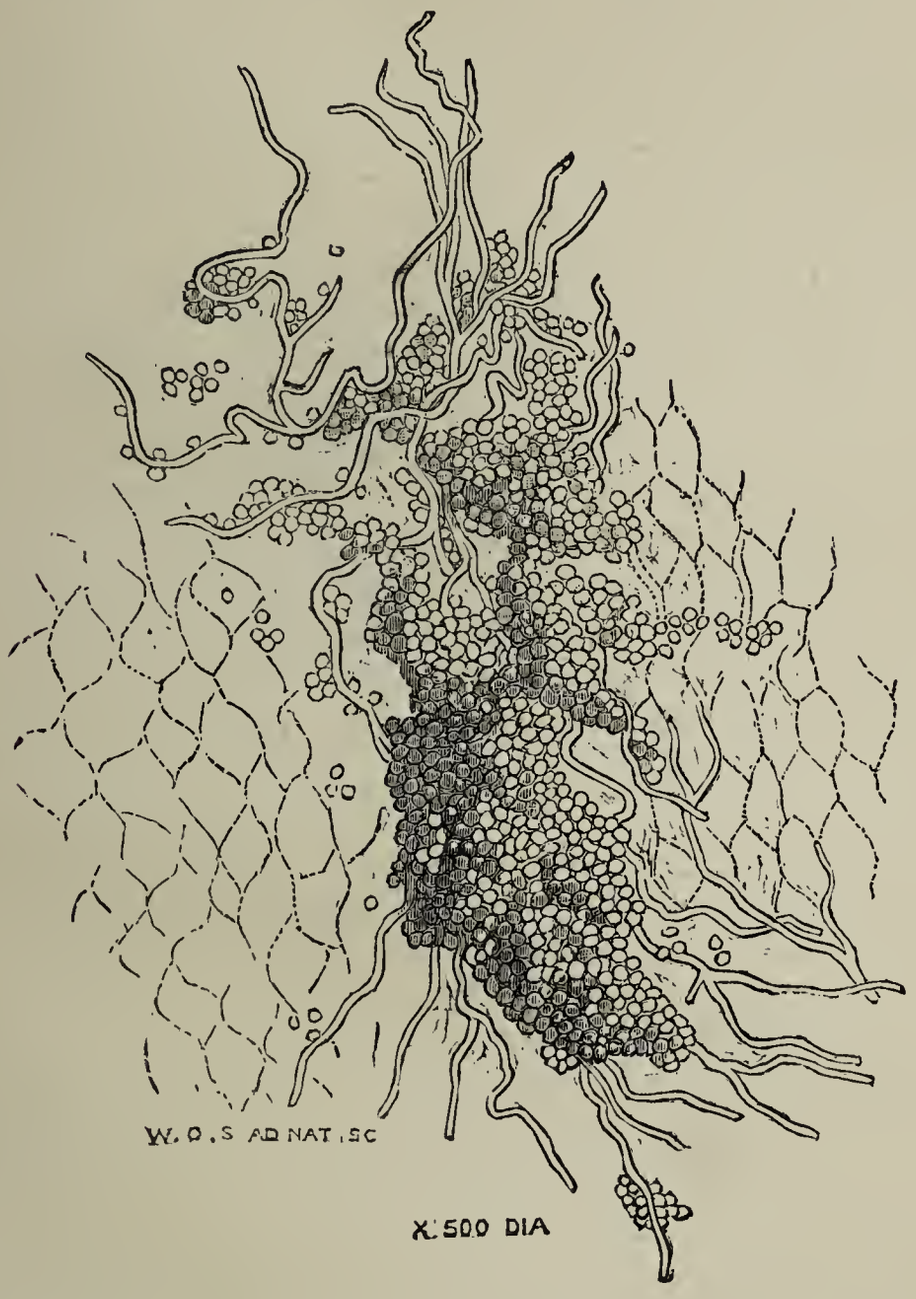
which the pony came were affected with ringworm, subsequent to the appearance of the disease in that animal.

What is still more interesting, however, is the fact that the man who was in special charge of the pony at the Veterinary College soon became affected (within ten days after taking charge of it) with tinea circinata, the fronts and backs of both arms being covered with patches, as well as the backs of the fingers; whilst subsequently the disease showed itself in two men who assisted to wash the pony before active treatment was employed, and in a third who held the pony and had given it drenches. In one of the two first men the patches occurred on the front of the arm in the form of large, irregularly circular patches, as well as smaller ones; these were raised, red, scaly, and itchy centres of tinea circinata with exaggerated features. In the second the disease assumed the form of what might be aptly styled "herpes circinatus," being composed of circles the size of a sixpence and a shilling, some ten or a dozen on each arm, in which the characters of well-marked herpes—*i. e.* distinct large vesicles seated in an inflamed base—were observable, especially at the commencement of the patches. The same man had a patch of sycosis on the left half of the upper lip. A specimen of the hair from the moustache being placed under the microscope, left no doubt as to the parasitic nature of the disease. In the third man the patches were small and few.

Taking all the cases of the seven men together, they had these peculiarities in common; the inflammatory aspect was more severe, the infiltration more decided, the extent of the eruption greater, and the herpetic character, when the earlier stages were observed, not at all abortive, but more distinct than usual. Moreover, in one case, the fungus, luxuriating amid the textures of the skin, set up so much irritation as to induce pustulation in place of the ordinary herpetic vesiculation in certain of the patches. In fact, as Dr. Fox remarks, the features of tinea circinata were not only peculiarly well marked, but exaggerated; a circumstance explained, as already mentioned, by the plentiful implantation of the fungus germs in unusual abundance and luxuriance, and the setting-up, by its vigorous growth, of an unusual amount of irritation. So that, in fact, the disease looked like an ekzema, and might readily have been mistaken for the same. Dr. Fox asserts that there are, indeed, cases which are ordinarily mistaken for ekzema in practice, but which are in reality exaggerated tinea tonsurans.

A portion of the epithelium from a patch on the arm of the

man who attended to the pony at the Veterinary College, showed a most luxuriant growth of fungus in the mycelial and the sporular form; there were miniature threads and also mature threads in abundance, breaking up into the reproductive bodies called "spores" or "sporules" by medical men, but more properly termed "conidia." The adjoining figure gives a very good illustration of the characters of the fungus present in the skin of one of the men. There were indications of a



fructification possessing the characters of penicillium, and Dr. Fox had no doubt that cultivation experiments would give absolute evidence of the production of the latter from the tricophyton in the instance alluded to. "Perhaps I may be allowed to say," he adds, "that many years ago, I concluded from my own observation and experiments that the tricophyton, the oidium, and the human epi- and ento-phytes are identical in nature with, though differing in mere form from,

penicillium and its allies—mere form goes for nothing as a differential test of fungi—and I gave figures in my work on 'Parasitic Diseases of the Skin;' but Hallier, that most inventive of fungological nomenclaturists—I suppose, because he is a foreigner with a taking name—has got the credit which belongs to myself."

In his subsequent remarks on these cases, Dr. Fox states that he does not think it needful to attempt any elaborate proof of the conveyance of the disease from the horse to the men. Ringworm of the hairy parts, tinea tonsurans, he says, gives rise, when it infects the non-hairy parts, to tinea circinata, or so-called herpes circinata: the two diseases are the same, the difference of aspect being due to the presence of hairs in the one case and their absence in the other. The ringworm in hairy animals, according to him, must of course assume the aspect of tinea tonsurans. "We should expect," he says, "that tinea tonsurans of animals, if communicated to man, would produce tinea circinata of the non-hairy parts, and not tinea tonsurans of the scalp; for the latter is practically unknown in the human adult, whereas tinea circinata is abundantly common. But in the present instances the disease was at once and directly inoculated into the forearms and hands: hence the explanation of its occurrence there. Whether, if the hairy scalp had come into contact with the coat of the diseased pony tinea tonsurans would have resulted, is an interesting speculation. I doubt it. But, in reference to the question of age, it is interesting to note, that whereas in the human adult tinea tonsurans is infinitely rare, and may be regarded as unknown in old age, this does not seem to hold good with regard to the horse, for our pony is a very old one."

Dr. Fox remarks, in addition, that the production of parasitic sycosis in one of the men is very interesting, and furnishes one more strong fact in proof of what has been held of late by many—the identity, making allowance for difference of seat—of tinea tonsurans, tinea circinata, and tinea sycosis. Ringworm of the surface varies much in aspect, from a mere erythematous desquamating patch (so-called parasitic pityriasis) to a pustulating surface simulating an ekzema; the two extremes being connected by transitional phases, represented by an abortive herpes, a well-marked herpes, or a desquamating circle with a fairly-marked herpetic edge, the occurrence of herpetic vesicles being dependent upon the production by the parasite of a certain degree of irritation: hence the term "herpes circinatus" is an objectionable one for parasitic disease of the surface. "I trust that the term

'epizoötic herpes,' as applied to animals, will be abandoned in future by Veterinarians, and that of 'tinea tonsurans' substituted instead. 'Herpes circinatus' of the hairy parts is 'tinea tonsurans,' and tinea tonsurans of non-hairy parts is tinea circinata. I have been informed by eminent veterinary authorities, who have seen the white pony at the Veterinary College, that the disease from which it is suffering is not like ordinary ringworm in the horse. All I can say is, that the disease from which the white pony is suffering is well-marked tinea tonsurans in an extensive form. At present sufficient time has not elapsed for the fungus to invade the hairs and split them up in any abundance; but in some parts the hair is thinning out, and I have no doubt baldish places will soon be produced, studded over with short broken-off hairs, if the disease be let alone. I imagine that under the term 'ringworm' many very different diseases of the horse—ekzema, simple herpes, &c., are mixed up together. I should say that if there be any differences in the fungus observed in the case of tinea tonsurans in the horse in the present instance, as compared with the ordinary appearance of the trichophyton growing upon man, they are differences not of kind but of luxuriance. There is more mycelium of a very vigorous growth, but only such as is seen in Burmese ringworm, where the operation of an excessive amount of heat and moisture is favorable to the growth of the fungus. The spores, however, are of the same size and character, though perhaps more abundant. Difference in size goes for nothing, however, as I have long ago shown, as a specific distinction among epiphytes. It may be supposed that in all likelihood there would be a difference in the characters of vegetable parasites found in man and in the horse, as is the case with animal parasites. I am unable to find any in the present instance, save in regard to luxuriance; and I think the facts which we possess touching favus and other parasitic affections in man and animals, rather tends to prove that there is an identity as regards the characters of these latter diseases and the fungi or epiphytes which cause them, whatever may be the case with regard to epizoa."

Allusion is made to the history of an epizoöty of tinea tonsurans, or, as it was designated, "epizoötic herpes," which occurred a few years since in the valley of Borne, in Savoy, as related by the veterinary professor, Papa, who was instructed to investigate the circumstances connected with the outbreak. A number of instances are recorded in which the disease was communicated direct from the horse to man,

and from man to man, man to wife, and wife to infant. The malady attacked the horses and mules about the head, the neck, withers, shoulders, and loins. It was attended by itching, which was at first thought to be due to acari, but its real nature soon became apparent. In one instance, a lad 16 years of age, who had jumped upon one of the diseased animals bare-backed, to take it to water, was affected by the disease over the inner surfaces of both thighs—the parts which had come into direct contact with the horse's back. It is further worthy of remark that in the cases mentioned by Professor Papa, the communicated disease in the non-hairy parts of the men was an exaggeration of the ordinary so-called herpes circinatus, or properly, tinea circinata, though this was not pointed out by him. The patches were observed to be studded over, here and there, with small pustular points, indicative of a more than usual amount of irritant, and produced by a plentiful sowing of fungus elements upon the skin.

Referring to the rather common occurrence of transmission of this parasitic disease from the calf and ox to man in Ireland, Dr. Fox makes the somewhat astounding statement that he is not able to put his hand "upon any save a few recorded instances in which man has become infected from the horse—*an occurrence unknown at the Veterinary College*"!! The pages of the *Veterinarian* have, in recent years, contained the history of such transmissions, and within the last two years even, Mr. Nettleship relates its communicability. Cases are within my own knowledge, and since 1852, foreign veterinary literature furnishes an abundance of such occurrences. In that year a horse was brought from Normandy to Paris, as a remount for the *gendarmerie* of the Seine; it was affected with the malady, which it communicated to eight horses and five or six men. The disease was distinctly recognised in them all. At the commencement of 1857, the able veterinary professor of the Alfort School, M. Reynal, presented a complete account of the affection in the horse and ox, and proved its contagiousness. About the same period, or a little later, Gerlach, the talented professor of the Hanover Veterinary School, described the disease very minutely, and particularly as it manifested itself in the ox and dog. In the latter the form varies somewhat, according to the breed, and the structure of the skin, its colour, and the hair with which it is covered. Beneath the crust that accumulates, the skin is dry or humid, thickened or not altered; sometimes deprived of hair, sometimes with the hair short and stubbly. The disease generally appears in the circular

configuration, though frequently the patches are modified, owing to the pruritus, which causes the animals to bite or scratch them and disseminate the spores irregularly. It has never been seen to disappear spontaneously. The spores are not so large as those observed in other animals. Experiments have proved that it is transmissible from one dog to another, to the horse, and to mankind; but it has not been communicated to the bovine species.

In the ox this parasitical affection manifests a predilection for the head and neck, though it may appear on the other regions of the body, with the exception of the inferior parts of the limbs. The malady is most severe, it is imagined, in dark-skinned animals; the hair of these more readily breaks than in those which have white skins. The disease disappears at certain points without treatment, and reappears at others, especially in young animals. The malady is readily transmissible to other creatures of the same species, and it is worthy of remark, as a characteristic feature, that in artificial infection the parasite shows a tendency to assume the circular form, even when the sporules are sown in a linear manner. The spores have been proved to maintain their faculty of germinating for a long period—more than six months.

This bovine tinea is not communicable to sheep or pigs, and in the horse its transmission is, according to Roell, marked by an eruption that soon spontaneously subsides. When transmitted to man, it readily developes; and, after the observations recorded by Gerlach, gives rise to an annular configuration on the arms and legs. It is easily re-transmitted to the ox. In aged animals it usually disappears without treatment; but it is more persistent in young ones, and, unless submitted to remedial measures, is liable to prove troublesome.

Bœrensprung, of Berlin, had affirmed several years ago that tinea tonsurans was transferable from animals to mankind, and *vice versâ*. Delafond, also, a long time ago, emitted this opinion; and Lafosse, of the Toulouse Veterinary School, had collected, in 1861, eleven undoubted cases of transmission of the disease to men and women. The latter distinguishes the two varieties—herpes circinatus and herpes tonsurans. The latter he describes as having the diseased patches always forming a complete circle, with sometimes the coin-shaped crust occupying it very evenly limited around its margin, and with a notched edge (*bord taillé à pic*). This nummulary production is grey or brown in colour, adheres closely or loosely to the skin beneath, and is consistent or farinous in texture. Herpes circinatus differs from the latter form by

the somewhat remarkable fact, that in the centre of the invaded surface the skin is healthy, being surrounded by a ring of variable dimensions, which alone is the diseased part.

Lafosse admits that on the same animal the two varieties of the disease may frequently be witnessed at the same time.

Among army horses in this country, tinea tonsurans is not a very rare malady, though, as a rule, it appears among them from contagion. Remounts join affected with it, or it is obtained in billet stables in rural districts, when regiments are moving from one station to another.

The disease is always most prevalent among agricultural stock, and is an indication of a neglect of hygiene; it appears more especially during cold and damp seasons, when the animals, debilitated by bad food, are lodged in dark dirty dwellings and not groomed. Their skins, thus prepared, become a favorable soil for the reception and growth of the sporules or spawn of the fungus—a kind of mushroom bed, in which these find all that is necessary for their vigorous development. Is there any relation between the sporules of tinea tonsurans and those which constitute mouldy forage?

Though tinea tonsurans more frequently affects young than old animals, yet it is by no means uncommon in the latter; only last year I saw a very aged horse belonging to a farmer in Warwickshire, which had its neck and body closely covered with crusts and patches.

The treatment of the affection in young vigorous animals is usually quickly and completely successful; but in those which are poor, old, and in a state of marasmus, it is not so easy to restore the skin to its normal condition. Alkaline dressings, preparations of tar or carbolic acid, corrosive sublimate pommades or lotions, and nitrate of silver, have all been found suitable remedies. With troop horses I have employed a strong tincture of cantharides with advantage. In all cases, however, hygienic measures must be chiefly relied upon. Good food, cleanliness, and abundance of daylight are certain preventives. With cows kept during the winter in a filthy state in dark sheds, the malady frequently disappears spontaneously when they are turned out to graze in the open air in the spring.

These remarks on tinea tonsurans will, I hope, fitly supplement those which have recently appeared in the *Veterinarian* relative to the observations on tinea favosa by Professor Saint-Cyr, and the excellent and valuable communication of Mr. Macgillivray, of Banff, in the number of this journal for March.

It must be confessed, that perhaps no division of our science has been more neglected in this country than that of dermatology. It would appear as if the numerous diseases to which the skins of animals are liable could all be classed as mange, ringworm, and surfeit.

COUP DE SOLEIL.

By R. Spooner Hart, M.R.C.V.S., Indian Army.

I beg to ask the favour of being allowed to pen a few remarks on the subject of *Coup de soleil*, as affecting horses in India. *Synonyms.—Heat Apoplexy, Sun Fever, Sunstroke, Megrims, &c.*

Seeing how limited our knowledge is of the nervous system, in treating with a disease affecting the main centre of that system, we find great difficulty in handling the subject, and we must be satisfied to refer for an explanation of the symptoms we meet with to hypothetical analogies. For in no organ or system of the body is there such an apparent want of accordance and definite relation between the symptoms of disease, the structural derangements, and the changes produced by it as in the nervous system. Our physiological knowledge of the laws governing the nervous functions is far from being equal to our acquaintance with the functions of other organs. With reference to many diseases, such as those of the abdominal and thoracic viscera, we are enabled to form a pretty good idea of what is going on. In consequence of our imperfect knowledge of the laws governing the nervous system in health, it is manifestly impossible that we should be enabled to define deviations from the healthy standard. Researches have demonstrated the close relation of the state of the vital fluid to cerebral derangements; and shown that most fatal effects may be induced without any palpable changes being wrought in the cerebral mass. The poison that may be in the blood may elude chemical test, and yet be productive of death.

Coup de soleil is a disease characterised by the suddenness and fatal nature of its attack, it affects horses that previously had given all the signs of good health. The victims to it are observed to stagger and fall, and to rise and fall again. The prominent symptoms are vertigo; unsteady gait; partial insensibility; pulse full and infrequent; superficial vessels

of the body prominent and engorged with blood, great heat of skin; respiration difficult and oppressed; anxious countenance, sinking of the pulse; cold, clammy sweat; exhausted and prostrated nervous energy; coma and convulsions, indicating congestion of the lungs and brain. I have observed that the effect of the sun is to produce on some horses symptoms of disease of the lungs, whilst in others there is the cerebral form of the disease; it is also very common to get colicky pains, and crouching and curving of the spine, with attempts to gnaw the part with the teeth. All these symptoms are indicative of lesions of the great cerebral ganglia. The symptoms are somewhat analogous to those shown by horses who fell victims to an epidemic fever which was prevalent here in 1869 and the early part of 1870, and is again existent just now. In fact, where the seizures of sunstroke are of a milder nature, the case proceeds into one of fever, and is frequently associated with laminitis.

The majority of cases occur in May, June, July, and August, and particularly on days that are hot, close, and steamy; and when we have an elevated temperature, a proportional rarefaction of the air and a diminished supply of oxygen for respiration, causing deterioration of the circulating fluid, depression and exhaustion of the nervous functions. Occasionally there are such accessories as driving with a tight collar, fatigue and its results, often acting on a system worn out in an aged horse, or debilitated by poor feeding; blood horses, or those that are tolerably well bred, stand tropical exposure and fatigue very much better than those that are ill bred. It is common among imported Australian horses, from a want of acclimatisation, or from their not having properly recovered from the effects of a long sea voyage, during which time they have been inhaling vitiated air, and are frequently landed in a half-poisoned, impoverished state, and not uncommonly with lungs more or less loaded with adventitious products. Horses bred in the country and Arabs are not quite so susceptible of sunstroke, although they frequently fall. Roarers, beyond all other class of horses, are seen to suffer most; and those with disease of any of the viscera, and which suffer from exposure and fatigue, are also very liable to the disease. I have never yet seen a case of sunstroke occur merely from standing in the sun; but it is common to get cases showing slight congestion of the lungs ending in feverish reaction or sun fever from this cause. The condition of the heart, brain, and lungs resulting from the extreme solar heat and fatigue appears to be one of congestion with depression of nervous energy.

Treatment.—The success of which will depend mainly on the timely application of each remedy. The treatment which I carry out consists of bloodletting, cathartics, clysters, cold water to the head, spine and body, antimony, calomel, opium, stimulants, perfect rest, quiet, darkness, and removal of all agents which tend in any way to impede the circulation and respiration. If the surgeon sees the case early, before nervous and vascular collapse occurs, a small quantity of blood taken from the jugular will be a step in the right direction, by relieving the thoracic and cerebral congestion; it will generally be followed by an alleviation of the symptoms. This must be followed by a diffusible stimulant, with a little Tinct. Opii, to rouse and support the flagging nervous and vascular systems.

Cold water should now be vigorously thrown on the head, neck, spine, and body with good force. The after-treatment is much the same as one would carry out during convalescence after an attack of ordinary fever. If this treatment is carried out early in the disease, and while the nervous and vascular systems retain a small amount of tone, we shall be rewarded with good success in many cases. But after a time the vessels of the lungs and brain lose their tonicity, and the treatment then fails to relieve the congestion, and tends to do harm. If the subject can walk, or be carried to an infirmary close by, it is certainly advisable to do so; or, if not, some shade or protection from the sun should be erected over the patient, or advantage taken of a near standing tree, until the horse shall have recovered sufficiently to be enabled to walk to the desired destination; and then to be placed in a perfectly dark, cool, and roomy box, with plenty of straw, and where quietude will be enjoyed. If a "punkah" or fan can be set going over the subject it will have a very refreshing effect. When first taken, the harness should be immediately removed to afford every assistance to the circulation and respiration.

I cannot speak too highly of the effects of cold water to the head, spine, and body. This must be perseveringly applied until the horse begins to show signs of animation and recovery. The appliance of cold water can be effectually performed by three or four men with pails, and who should dash the water on with good force. The capillary circulation being stagnant, like that of the great internal viscera, friction to the whole surface of the body will prove of great efficacy. Three or four men with wisps of straw will be necessary in order to have it well done. Speaking of this species of shampooing, I can

answer positively for its good effects in many cases of colic, particularly when the patient is sweating profusely.

If visceral complications or laminitis arise, they must be treated on general principles. But, do what you may, the recovery will be tardy and protracted, and in some bad cases the subjects will always be susceptible to an attack; although they may get into good working condition, they fall quickly on a little sun, exposure, and fatigue. Frequently a removal to grass will act very beneficially towards inducing a tonic state of the health. I have observed in some cases an entire inability to progress forward, and to a readiness to go backwards; and in more than one instance I have taken advantage of this retrograde movement in getting my patient home or to a favorable spot, near water or under the shade. As regards the administration of an aperient, I have in some cases given it shortly after seeing the case, whilst in others, and with very good effect, I have administered in the evening the following:—

℞ Sol. Aloes, ℥ij;
Tart. Emet.;
Ext. Bellad. āā, ℥j;
Nit. Pot., ℥ss;
Mag. Sulph., ℥iv. Mist. Haust.

The arguments against venesection, in my opinion, find their foundation on the ill-timed application or misuse of the operation; bleeding late in the disease is like taking blood from dead subjects, for we must not forget that the circulation has almost ceased, as have the cerebral functions. In fact, if a case is not seen until too late for the active line of treatment mentioned to be of service, all that is left to be done is continuous friction to the extremities, hot water bandages, cold water to the head and chest perseveringly applied, and the aloetic aperient administered, and friction to the body. If the case is not seen until the latter measures are necessary, I can say but little for the recovery of the animal; although, if the treatment is perseveringly kept up, horses which present a hopeless aspect will sometimes cause an agreeable surprise by becoming convalescent.

Post-mortem.—Out of many cases, scarcely two will give the same results. The morbid changes found seem to be regulated by the more or less rapid course which the disease has taken in the subject under ken. But, as a rule, we find congestion within and without the foramina, with effusion of a watery-like fluid slightly tinged with blood on the surface, and within the ventricles of the brain, with lungs more or less congested and engorged.

I conceive that death may happen in several ways, viz.: from asthenia, apnœa; or coma, which is but a form of the apnœa; in the latter state the chemical functions of the lungs cease first, and the venalised blood suspends the sensibility, and causes convulsions; whereas in death by coma the cerebral functions cease first, leading to arrest of the functions of the lungs. The venous blood in the arteries in one case is the cause, and in the other the effect, of the cessation of life.

Prevention.—The sun being the primary cause, avoidance of so much solar exposure must form the first item under this head. It occurs to me, from the experience which I have had with imported Australian horses, that if they are allowed sufficient time to recover from the effects of their voyage, and are afterwards properly managed, they are then capable of performing as hard a day's work under the hottest sun of India as their rivals in the market. I speak with reference to Arabs, and those bred in the Government studs.

During the latter part of 1869 and the early part of 1870 it was no uncommon thing in Calcutta to see horses whilst at work wearing sola hats or "topees." The novelty did not last long, and one had not sufficient experience to say whether the hats protected horses from sunstroke or not. The harness should be made to fit loosely, to allow of the most perfect perfect freedom of respiration and the movement of the body, so as not to interrupt the circulation. If long journeys are to be taken by horses, they should always be conducted slowly, and as much as possible under the shade of trees, and always during the night if circumstances will permit of it. Cavalry marches in India are always nocturnal, except on active service. The stages should be short, only of a few hours' duration, and at the end of each stage the horse should have a little food and water. Bathing of the face and head every now and then with cold water will prove very refreshing. I suggest that horses which have once had an attack should be used with a cap or bandage of spongio-piline; this material, with one good wetting, will remain cold and moist for some considerable time. If such horses could be put to night-work they would then be enabled to perform good service in a satisfactory manner.

It may not be out of place here to state that spongio-piline forms one of the best eye bandages you can have, in consequence of its retaining moisture, and at the same time remaining cool.

CRITICAL *RESUME* OF THE ETIOLOGY OF BLACKLEG, &c.

By A. G. Rolls, M.R.C.V.S., Arundel.

Synonyms.—*Inflammatory Fever, Hæmatosepsis* (Simonds), *Black Quarter, Quarter Ill, Puck, Gloss Anthrax, Splenic Apoplexy, &c.*

French Names.—*Charbon, Gloss Anthrax, Avant Cœur, Etranguillon, &c.* German Names.—*Milzseuche, Sommerseuche, Beulenseuche, &c.*

Amid the many subjects connected with veterinary science upon which veterinarians of different schools and nations disagree, is the important one of the principal producing cause of that blood disease known generally by one or the other of the above English names in different parts of Great Britain, and manifesting itself locally in the affected animals in various ways, but constantly presenting a blood alteration, recognised on *post-mortem* examination, by non-coagulability, by a difference in colour, it becoming much deeper in hue, and, when rubbed on the fingers, presenting a blackish-brown tint, and its rapidly becoming, or being at the time putrid, with the presence, as seen under the microscope, of foreign bodies known as bacteria. The number of animals succumbing to this affection year by year must represent a considerable average, more, perhaps, than veterinarians imagine, as from the acquaintance the agriculturist has of the rapid and hopeless nature of the disease, he dispenses in many instances with medical attendance. This is then a subject well worth the attention of agriculturists and their societies, as intimately connected with their welfare and interest, while to the veterinarian it is one of those subjects which, if possible, should be brought from the realm of doubt and indecision to that of decided unanimous conviction, by calm reasoning and experienced observation and experiment. Let us glance briefly at the opinions laid down by some of our professors, standard authors and practitioners, and from them deduce the opinion held by the greater number of Englishmen, and then consider the opinions promulgated by most continental authorities. Youatt, in his work on cattle (edition 1870), treating the subject under the term inflammatory fever, says,

p. 357,—"There cannot be a doubt respecting either the nature or treatment of such a disease. It is at first of a purely inflammatory character, but the inflammation is so intense as speedily to destroy the powers of nature." At p. 358, "When the early part of the spring has been cold and ungenial, and then the warm weather has suddenly set in, nothing is so common as for inflammatory fever to appear; but the change in the temperature, or other qualities of the atmosphere, has had only an indirect effect in producing this; *it is the sudden increase of nutriment which has done the mischief.*" In that concise treatise on diseases forming the appendix of Mr. Finlay Dun's admirable work on veterinary medicines, and which we may consider as an exposition of the opinions held by the late Professor Barlow, whose article in a former volume of *Veterinarian* I am sorry I have not at hand, this disease is said (*Splenic Apoplexy*, p. 543) to result from the rapid manufacture of insufficiently elaborated blood, probably faulty in the healthy proportion of some of its constituents." It appears on rich alluvial pastures, where the grass is abundant and nutritious, and the stocking light." "Cattle and sheep that have been previously stinted, and are being rapidly pushed along, are especially liable to it." At p. 541, "Blackleg appears to be indigenous to certain farms, usually where the land is undrained, and the herbage coarse, rough, and innutritive; and has entirely disappeared from others, where drainage, top dressings, and better cultivation have improved the quality of the pasture." Professor Strangeways included this ailment in his class of dietetic diseases, and uses also in his lectures on it the terms "too rapid formation of imperfectly elaborated blood;" and also states "that there is a poison in the affected parts which may be communicated to man, and *vice versâ;* he considers this to be formed locally by the change the tissues undergo." In some notes, copies of originals taken of Professor M'Call's lectures, that gentleman is made to say, "When animals are reduced or emaciated, and then turned into luxuriant grasses, we get the animal plethoric, and as a sequel attacked with blackleg. The nature of the disease is admitted by all to be a blood disease, and it wants a general name. Youatt calls it inflammatory fever, but I prefer the term "typhoid inflammatory fever." The *Veterinarian* for July, 1871, contains in a paragraph on blackleg the following editorial remark:—"Similar reports have reached us from other sources, some of which clearly show that the disease was evidently due to an improper use of highly stimulating food." In a paper read before the

Liverpool Veterinary Medical Association by Mr. Henry Barnes on blackleg (*Veterinarian*, February, 1872), that gentleman says, "The predisposing causes of this disease are according to the preceding views, anything that induces too rapid a growth in the young animal, such as rich and succulent food, the natural result of an early spring, in which the grasses are forward, and full of moisture." "Those who have directed their attention to the subject have agreed that the principal proximate causes of quarter ill are a deficiency of fibrin and an otherwise vitiated state of the blood." It also appears to be indigenous to certain farms, usually where the land is undrained, and the herbage coarse, rough, and innutritive." It seldom appears on farms where drainage and better cultivation has improved the quality of the pasture."

It is also a popular idea among agriculturists that the disease is caused from the amount of too stimulating food young animals may receive.

The preceding quotations plainly show that British veterinarians, as a body, consider *the producing cause of black quarter to be the food, or rather the quality and the excessive quantity of it.* If we consider the evidence upon which this opinion is founded, we speedily find a discrepancy. Thus, if produced by the luxuriant grapes of rich alluvial soil, or by highly stimulating foods, we could hardly expect to find it occurring on coarse, undrained, innutritive pastures; but that it does so we too frequently experience. Again, if the disease is the effect of poverty of the blood and of deficiency of fibrin, is not this inconsistent with the fact that frequently the best animals of the herd are its victims? But it is hardly necessary to pause and criticise; rather let us pass on to the consideration of the views adopted by our continental brethren, and the facts which have induced them to repudiate the opinion they once held in common with ourselves. This disease occurs as an epizootic and as an enzootic, as we find in the chapter on the 'Etiology of Charbon,' by Renault and Reynal ('Nouveau Dict. de Méd. Vét.').

The principal outbreaks in France are stated to have taken place as follows:—

1731. In Auvergne, Bourbonnais, and Languedoc. Studied by Sauvage, and described by him under the name of gloss anthrax ('Nosologia Methodica,' t. ii, p. 360.)

1757. An epizootic of the same nature appeared in Brie. ('Audouin Chaiguebrun,' Paris, 1762.)

1763. In the greater part of Marennes. ('Nicolan. Mem.

de Barberet.') At this period Bourgelat, who had just founded the veterinary schools, recorded a consultation on this epizootic. (Rouen, 1763.)

1775. It was observed by Belleray on the borders of the Dordogne, near its union with the Garonne. (Bordeaux, 1775).

1779. It was studied by Dorfeuille in Agenais and Bigorre. (Park-Sainte-Marie, 1779.)

1780. This year is remarkable for an outbreak of charbon nearly all over France. Charberet and Bredin, with their numerous students, studied it, and endeavoured to stop its ravages.

1780 to 1800. New outbreaks among the domestic animals, occurring generally during a great elevation of temperature, and taking place successively in nearly all the departments.

During the existence of the present race of veterinarians it has broken out at various periods, and been studied by several of them. In Aneyron by Roche Lulim ; in the Loiret and Garonne by MM. Goux and Dupont; in the Hautes Alpes, by M. Reys, who was sent to investigate it. M. Renault was sent, in 1846, to study an enzootic of charbon in Allier and Nièvre ; at the same time M. Delafond was sent for the same purpose into the department of the Somme. In the Eure and Loire it has been studied by the veterinary society and the medical association of the department, and particularly by M. Garreau, veterinarian at Chateauneuf, who was recompensed for his work on this subject by the Imperial and Central Society of Veterinary Medicine at their meeting in 1847. This gentleman, an influential French authority on a form of charbon affecting sheep, and known as *sang de rate* (splenic apoplexy) has recently published an essay on this disease (*Recueil de Médecine Vet.*, July and August, 1871), from which I now translate the latter half of the chapter on etiology, and also a chapter on experimental feeding.

"*Thermometric and Atmospheric Observations.*

"1852.

"The winter of 1852 was very temperate. In January the thermometer averaged +° Cent.; in March it rose to 22° Cent. In spring there were complaints of drought.

"The spring commenced with a temperature of +15° to +22°; towards the end of April the thermometer fell below 0°.

"The temperature of the months May and June was moderate and dry.

"During summer there were periods of very great heat. The thermometer rose in July to +35°, tempeature unusual for Beance.

"*Autumn.*—The months of October, November, and December were very temperate; the last was very remarkable for its mildness, the average being +5° each.

"1853.

"*Winter.*—After the abundant rains and snowstorms of January the temperature of the first three months has averaged 2° lower than in 1852. The highest temperature in March has not exceeded + 12°. It descended on the 18th to — 5°. There were thirteen days of frost, during which agriculture was stopped, and the cold weather persisted until April 27th.

"At this period there was a sudden change in the atmosphere; the thermometer rose from 0° to + 14°. The weather was constantly cloudy and rainy in May and June. There were five storms, three of which overflowed the valleys; that of the 22nd June inundated Eure.

"The summer was temperate and rainy, happily alternated by moderate heats. The thermometer varied from +14° to +28° at the highest.

"Rains in October, alternated with some fine sunny days, with an atmosphere charged with electricity. Excessive cold, hard frosts, and very abundant snowstorms in November and December. At Christmas the thermometer fell to 12° below zero.

"*Atmospheric State of the Year.*

Résumé.

"In the year 1852 rain fell in small quantity. Sky clear, heat, and great drought. Part of the year the marshes of Beauce were not covered with water; the prevailing wind was from the north-west. The year was one of the driest in Eure and Loire.

"1853.

"Very abundant snow and rain. Sky nearly always cloudy; inundation of the valleys. Permanent humidity. West winds prevailed nearly all the year. The year 1853 was remarkable for its great humidity.

Practical Consequences.

Influence on Vegetation.

"In 1852

"The germination of cereals was slow, because of the drought.

"Vegetation, after pushing vigorously in March, was stopped and burdened at the commencement of spring by the dryness of the earth and the cold weather of April. This stoppage of vegetation lasted until June, when the wind changed to the west, and rain fell in abundance during the season of flowering and during the harvesting of artificial grapes, which were badly got in.

"Owing to the dryness, the natural pastures grew but very little hay, and the second and third cuts of lucern were small. Under the influence of the burning July sun the grains dried up in the ear. We now know the result of this bad harvest, the produce of wheat and oats being much below the average.

"In 1853,

"From the mild temperature and humidity, the cereals grew very much in winter. In February and March the artificial grapes and several trees were in flower.

"The frosts of the latter days of March stopped vegetation, and threw it back fifteen days throughout the spring. In May, under the influence of heat, fogs, and storms of rain, vegetation underwent a happy transformation. The oats which germinated with difficulty in March looked well. The artificial grapes were abundant, and well harvested; a good crop of meadow-hay in the pastures, second and third cuts of the artificials abundant.

"Abundance of pasture, rich, strong, and very watery. The harvest was favoured by several fine, sunny days. Oats yielded well.

"As a whole, the grass and hay harvest was better, but not sufficient to make up the deficiency of 1852.

Influence on Animals.

"1852.

"If we examine the metereologic influence on animals, we find a great number of beasts were the victims of the charbonne fever called *sang de rate;* it may be from the great heat of summer, or from the drying up of all the ponds and lakes of the plateau of Beauce. This influence was so great, that, after having lost its intensity by the August rains, it still made some ravages in the autumn season.

"1853.

"In the poor countries, deficient in agricultural pastures and in vegetable earth, as in Perche, anæmia, wrongly considered as being the first degree of cachexia, invaded the flocks of merinos in the first months of the year.

"At the same time, the bad condition of the fodder of 1852 influenced in an unfortunate manner the persistence of the disease of the blood in Beauce. This ought to be considered as the termination of the epizootic which affected in the preceding autumn all cattle, and which disappeared very soon under the influence of the permanent humidity of the air and of the soil, to give place to foot-rot, which, with cachexia aquosa, persisted in an epizootic form in several localities until 1854, a period of time during which not a single case of *sang de rate* was observed

The parallel between two years of such opposite nature must be incontestably useful in enabling every one to appreciate the part played by great heat and long droughts in the production of *sang de rate*. This is rendered more evident by our subsequent observations.

1856. *Atmospheric Variation.*—During the past six months permanent humidity and moderate temperature. In May, overflow of the rivers and inundations of the valleys. Great heat; the temperature rising in July and August from 29° to 34° Cent. The autumn was tempered by rains, happily distributed.

Influence on Flocks.—No mortality in spring. It was not until after the burning heat of July and August that *sang de rate* appeared on certain farms, and then rapidly disappeared.

Conclusion.—This favorable result should be attributed in great measure (1) to the idea of contagion commencing to be entertained; (2) to the order of M. de Grouchy, then Prefet of the Eure and Loire, in which, after enumerating the laws and orders relating to the sanitary police, the honorable magistrate ordered the agriculturists to bury their dead animals, and told the slaughterers not to commence until they had given notice to the mayor, &c.; (3) to the abundance and salubrity of the water of the ponds and lakes.

1857. *State of the Atmosphere.*—Temperate, not too dry, not too humid during the first six months. Storms of rain and heat, which damaged the hay and harvest in July, especially from the 12th to the 15th of the month; the thermometer rose to 95°. Favorable alternation of dryness and heat in autumn.

Consequences in Animals.—Sanitary condition satisfactory at the commencement and end of the year. *Sang de rate* appeared here and there after the July heats, and the mortality in some flocks reached from 10 to 20 per cent.

1858, 1859.—After a long and great drought all the ponds dried up, and remained part of the year without water. Vegetation, after having sprouted vigorously, was stopped in such a manner that the artificial grapes and oats, which had looked well in May, were dried up under foot. In consequence of the scarcity caused by this drying up, a great number of agriculturists, afraid of being short of food during the winter, diminished their flocks, either by selling at a low price, or by ceasing to breed. As a consequence of this state of things, we should expect, if, as it is believed, the use of an abundant nourishment is a principal cause of *sang de*

rate—we should expect, we say, to see no mortality in the flocks in 1858.

A complete error; for never since 1852 to this day has *sang de rate* made more victims than during the scarcity of 1858. In retaliation, in spite of the abundance of the July heat in 1859, Beauce has never lost so few animals from *sang de rate*. Although attributing the favorable result of this last year (1) to the goodness of the straw and hay harvested during the drought of 1858; (2) to the greater purity of the water of the ponds, which, having been dried and cleansed by the dryness of 1858, were filled by the abundant rains of June, 1859; (3) to the forced necessity of varying the food by the methodical use of substances and plants neglected in times of abundance; these results nevertheless prove by comparison a lesson which the agriculturist would do well not to forget.

When after an insufficient harvest in grain, as in 1852 and 1858, we see flocks ravaged by *sang de rate;* when, in spite of the abundance of harvest in artificial hay and grains, as in 1853 and 1859, there is no mortality caused by this disease; when agriculturists and sheep dealers fatten millions of sheep on leguminous fodder, without anything happening, whilst neighbouring flocks nourished moderately have great losses; lastly, when *sang de rate* attacks indiscriminately animals of all ages—fat, vigorous, and plethoric sheep, as well as those thin, feeble, and languid—does there not result the following positive demonstrations?—

1. That in 1855 we were right in holding that the use of too succulent food given in excess to flocks could not occasion *sang de rate;*

2. That, whatever may be the quantity and the nutritive value of the food given to animals, and whatever may be its nature, grain, roots, natural or artificial fodder, if they are of good quality, they are without influence on the development of the disease termed *sang de rate;*

3. That the best means of preserving animals from it is the use of good nutritive food given with discrimination.

As it is necessary that opinion may be well fixed on these questions, we shall terminate by supporting our views by an experimental demonstration.

Experiments on Feeding.

Experiments of this kind would never have been undertaken if the superior administration of agriculture had not given the means to execute them. Thus, a fresh commission was named, fifteen years since, in the department of the

Aisne, under the presidency of M. Yvart, and at the expense of the government, to determine if *sang de rate* was caused by abundant feeding on leguminous fodder. Without invoking the negative results of experiments made outside Eure and Loire, we will say that, at the request of the Concile-Général of the department, and by the efforts of the Préfet, M. Jaubert, a similar commission was appointed to study this disease in all its details. Honoured by forming part of this commission, we are going to show the important results obtained relative to this question.

The experiments undertaken for this purpose were made without interruption during four years, from 1858 to 1861, on more than 400 sheep, under the direction of the honorable founder of the Agricultural Union, which at this period (1857) had lost in less than two months the half of its flock. These experiments were commenced in the first days of July, 1858, and here is a summary of them, and circumstances under which they took place.

A flock of 159 sheep were divided into three equal lots, and, as much as possible, with regard to age, state of health, and condition.

The lot A, intended as a standard for comparison, were fed according to the ordinary custom in Béauce.

The lot B received a substantial nourishment with corn and leguminous fodder, considered as a principal deteriorating cause of *sang de rate*—lucern, vetches, wheat straw imperfectly thrashed, &c.

The lot C were nourished on food reputed up to that time as preservative from *sang de rate*. They lived on green rye, on after-grass still green; in summer and during the latter part of the year on natural meadows; and in winter they received straw deprived of corn, the after-grass of natural meadows, and one to two kilogrammes of red beets every day.

Under the influence of these various foods, the three lots were, on the 1st November, four months after the commencement of the experiment, in about the same condition. At the end of the year, on the contrary, the medium weight of the beasts of the lots B and C increased 8 kilog. 500 grammes, whilst lot A remained stationary.

In the autumn of 1859, about eighteen months after the commencement of the experiment, the lot A was still inferior to the other two lots B and C, which always remained in about the same condition.

Now that we have shown the hygienic result of these various modes of feeding, we will go on to consider the mor-

tality caused in each lot by *sang de rate* during the period of these experiments.

The lot A lost	7	animals from *sang de rate*.
The lot B lost	8	,, ,,
The lot C lost	9	,, ,,
Total .	24	dead.

It is best to add that in addition to these losses occasioned by *sang de rate*, and recognised after *post-mortem* examination—(1) That in the month of January, 1860, three sheep of the lot C died cachectic; (2) that, on the other hand, several sheep of the lot B refused, during the same month, all kind of food, wasted daily, and succumbed to anæmia; (3, lastly) that the sheep of the lot C continued to die of cachexia.

In consequence of the two diseases produced by the exclusive nourishment to which each lot had been submitted for two years (it happens frequently that animals once fattened and not then killed succumb some time after), the experiment could not be continued as a test for *sang de rate;* the three lots were sold, and immediately replaced by a new flock composed of 180 to 200 sheep from twenty to twenty-five months old. In 1860 and 1861 the experiments were repeated on this new lot in exactly the same manner, with this important modification, in order to find out if, as had been stated by M. Hugard ('Esquisse de Nosographie Bêler,' 1825, p. 317), M. Yvart ('Recueil,' 1828, p. 383), and so many others, the principal cause of the disease was in the passage of a flock from a bad regimen to a more substantial one. The results obtained by the Eure and Loire commission in this second series of experiments were the same as the first; that is to say, at the end of 1861 the sheep, instead of dying of *sang de rate*, succumbed to hydræmic anæmia.

To resume, these repeated experiments demonstrate—

1. That a substantial stimulating food is not, as many still believe, a principal determining cause of *sang de rate;*

2. That refreshing watery food is not at all preservative;

3. That the sudden change of sheep from bad to good condition, and reciprocally, does not appear to predispose them to *sang de rate;*

4. Lastly, that the derangements which may result from food are due to its abuse, but these abuses are without influence on the development of *sang de rate.*

In the face of the results obtained by these experiments, to insist on it any longer would be to follow a phantom.

Synopsis of MM. Renault and Reynal's Chapter on the Etiology of Charbon.

The history of the outbreaks of charbon in France, which have been enumerated above, shows the influence of the temperature. Renault and Reynal discuss the causes under four different heads, as follows:—1. Influence of the temperature. 2. Influence of ponds and marshes. 3. Influence of the soil. 4. Influence of food.

In treating of the first influence, they say it has been observed to coincide in its appearance with humidity and persistent fogs (Goud). Humid, warm air, temperature stormy, alternations of burning heat and storms (Verheyen). The history of its enzootics shows that for centuries it has appeared in years where a very hot season succeeds without much transition to a very wet one. The years 1712, 1731, 1775, 1779, 1780, 1823, 1824, 1825, 1846, furnish but too memorable examples.

2. *Influence of Ponds and Marshes.*—After reviewing the marshy parts of France in which the disease is common, they say this fact is remarked, not only in France, but in various countries of Europe. It is enzootic in the marshy countries of Esthonia, Livonia, and Courland (Verheyen). In Poland (according to Verheyen) and Germany and Hungary charbon appears each year, attacking chiefly beasts in inundated pastures on marshy localities. In Spain it is enzootic in the submerged valleys and sea coasts of Catalonia (Escobar). In Corsica, especially the southern side, which is intersected with marshes and stagnant waters, the herdsmen emigrate with their flocks and herds to the mountains at the commencement of the hot weather, knowing by experience, if they did not do so, charbon would attack nearly the whole of the animals. In Siberia, which is covered with innumerable lakes and marshes, the beasts are each year decimated by the jaswa, or charbonic fever, which in 1784 killed 100,000 horses ('Ann. de Méd. Vét.,' 1854).

3. *Influence of the Soil.*—Charbon has been observed to more particularly take place in districts where the earth has a clay, calcareous schist, and calcareous clay base. It occurs but exceptionally on siliceous or granitic soils. M. Rivierre thus explains the fact:—"The arable layer, of slight thickness, easily allows the rain to penetrate it; this arrives at the compact clay and is stopped, forming a sort of internal marsh. This water, like that in the vegetable soils, holds in solution or suspension a quantity of animal and vegetable *débris*, which by the action of heat decomposes, ferments,

evaporates, and spreads in the atmosphere in the form of effluvia in emanations less watery but as deleterious as that of ponds."

4. *Influence of Food.*—After reviewing the various opinions entertained on this subject, which have been ascribed as principal causes, as—forage damaged by mildew, wet, frost, by the heat of the sun, and slimy deposit of inundations, the cryptogamic theory, &c., they resume thus:—"We think it is not demonstrated in the present state of science that food composed exclusively of damaged materials gives rise to charbon, exclusive of the conditions under which the disease generally occurs."

M. Reynault and Reynal conclude their observations on the etiology of charbon by the following general proposition:—"*That the causes of charbonic diseases are due to the emanations disengaged from the soil during the heat of summer, and to the various modifications undergone by plants under this influence.*"

M. J. Cruzel, a well-known French cattle pathologist, and author of a very practical work on the diseases of the ox, perfectly agrees with the article I have just quoted, and in a note in his work says, "The most complete work which has been published on the charbonic diseases is that of Renault and Reynal, and I think I cannot do better than take the greater part I have to say from it." ('Traité Pratique de Maladies l'espèce Bovine,' p. 577, 1869.)

Tundel, in one of his "Veterinary Chronicles of Germany" ('Recueil de Méd. Vét.,' May and June, 1871), discusses the etiology of charbon, and supports himself on the authority of the German authors. The gist of his remarks is included in the following quotation:

"Charbon is always due to an infection, to an active agent, which appears to be of cryptogamic nature, acting on the blood in the form of a septic ferment. This agent is a miasma that the animal finds about him; that is say, an organic substance, a *débris* of vegetable matter suspended in the air, and retained there by watery vapour; sometimes this miasma is found in the water, more rarely mixed with the solid bodies serving as food. It is in the miasma that we always find the cause of the *spontaneous eruption of charbon*, an expression slightly incorrect, but which I think I ought to preserve. The disease may proceed from infected animals; the miasma, the infecting agent, is multiplied then oftener after the fashion of a virus, and is communicated by fixed and volatile contagion.

"This infectious origin of the charbonic diseases, of vege-

table nature in spontaneous charbon, of animal nature in contagion, cannot in the present day be contested; neither simple plethora, nor fatiguing journeys, nor over-crowded stables, can occasion charbon."

I will refer to but one more authority, that of Dr. F. M. Röll, Director of the Veterinary Institute of Vienna. In considering the etiology of charbon, that gentleman says ('Manual of the Pathology and Therapeutics of the Domestic Animals,' 3rd edition, 1867), in describing the charbonic districts—"It is the organic substances decomposing under the influence of the humidity of the atmosphere which furnish the miasma, the cause of charbon. It results from evidence that an elevated temperature, favouring the evaporation of the water of these earths, rich in humours, with an impermeable subsoil, marshy or boggy, and in laying have a great quantity of organic substances enclosed in the soil, is favorable to the decomposition of these matters, and to the accumulation of the products resulting from it, in the soil, air, and beverages." And in the course of his argument a little further on, he says—

"The real producing agent of anthrax, miasmatic in its origin, appears, after Virchow, to act on the blood as a septic ferment. After a certain time the alteration of the blood will cause, according to him, local derangements, which in their turn will keep up the disease of the blood."

The preceding quotations plainly show that Continental veterinarians hold a decided opinion on the etiology of blackleg, and that opinion is in direct opposition to that held by British veterinarians. Further experiment directly contradicts the theory that this disease is caused by any use or abuse of ordinary food. Observers agree, however, in their description of the localities in which it is found: they are low-lying, liable to be flooded, in the vicinity of bodies of water, undrained; soils with an impermeable subsoil, rich alluvial soil, soils containing much vegetable matter. In these localities one aid alone is necessary to cause the disease, and that is a great elevation of temperature; this is a fact admitted on all sides, the result of ages of observation, chronicled in indisputable history. It is probable, for there are facts which rather seem in its favour, that the idea of Virchow may be correct, that, altered by the septic ferment or miasma, the blood produces local derangements of a gangrenous nature; these may be the focuses of a virus which keeps up the disorder of the blood.

It is much to be regretted that experiments are hardly in the power of veterinarians to test still farther the fallacy of

the food theory. Careful observation may, however, help us much in obtaining a decided unanimous conviction on this point; and my own experience, small when compared with that of men like Cruzel and Garreau (whose labours on this subject were rewarded by their colleagues as far back as 1847) and others, corroborates the Continental explanation.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p. 224.*)

The Amentales, which come next in order, forms a very interesting alliance, whether considered in reference to the structure of its members, or their distribution and uses. They may be diagnosed as follows:

Declinous exogens, with scattered monochlamydeous flowers, single superior carpels, and large embryo lying in a small quantity of albumen.

Professor Lindley states as follows:—"The main distinction between this and the Amentale alliance consists in the presence of albumen, and the flowers not being arranged in catkins. The former character, however, fails in several instances, especially in some Artocarpads and Hempworths; so that in reality the amentaceous inflorescence is the only difference that can be at present pointed out to separate two Alliances, which nevertheless appear to be really distinct if regarded as wholes. They touch most closely among the Planes and Artocarpads, which may be referred indifferently to the one Alliance or the other, for both have a quasi-amentaceous inflorescence, and Liquidambars agree with Planes in having albumen, while Artocarpus is said to differ from the mass of its order in the want of it. Artocarpus cannot, however, be separated from Ficus, nor Plantanus from Artocarpus, and this seems to justify the place assigned to Artocarpads and Planes in this arrangement."—'The Vegetable Kingdom,' p. 258.

The learned professor divides the Alliance into seven natural orders, all of which contain some most interesting plants. We commence our description of some of them with a few notes on the *Urticariæ* or nettle tribe.

Nettles are well known to us through our native species,

of which the common stinging nettle *Urtica dioica* may suffice for illustration. Speaking of the property from which it gets its significant name, Dr. Pereira says:—

"The most remarkable property of the order is the acridity (sometimes very extreme) of the liquid contained in the epidermoid gland at the base of the stinging hair. Endlicher says that it is bicarbonate of ammonia; but this is an obvious error, as ammonia in any known form is incompetent to produce the violent effect ascribed to some of the East Indian *Urticariæ*."—'Materia Medica,' vol. ii, p. 365.

We copy the following description of the effects of the Indian Nettles by Leschenault de la Tour, while gathering *Urtica crenulata*, in the *Calcutta Botanical Garden*. He says:

"One of the leaves slightly touched the first three fingers of my left hand; at the time I only perceived a slight pricking, to which I paid no attention. This was at seven in the morning. The pain continued to increase; in an hour it had become intolerable; it seemed as if some one was rubbing my fingers with a hot iron. Nevertheless, there was no remarkable appearance; neither swelling nor pustule, nor inflammation. The pain rapidly spread along the arm, as far as the armpit. I was then seized with frequent sneezing, and with a copious running at the nose, as if I had caught a violent cold in the head. About noon I experienced a painful contraction of the back of the jaws, which made me fear an attack of tetanus. I then went to bed, hoping that repose would alleviate my suffering; but it did not abate; on the contrary, it continued nearly the whole of the following night, but I lost the contraction of the jaws about seven in the evening. The next morning the pain began to leave me, and I fell asleep. I continued to suffer for two days, and the pain returned with full force when I put my hand into water. I did not finally lose it for nine days. A similar circumstance occurred, with precisely the same symptoms, to a workman in the Calcutta gardens. This man described the sensation, when water was applied to the stung part, to be as if boiling oil was poured over him."

Of course, with such properties as these, Nettles in all time have been held in high repute for medicinal virtues. "The nettle brose" of the Scotch is, like most green vegetable concoctions, antiscorbutic, and on the doctrine of Signatures "nettle tea" commended itself for nettle-rash. The young tops of the common nettle boiled down form no bad vegetable, bnt the time has gone for any value to be attached to its medicinal value, although we have recently known the fresh plant used as an excitant in paralytic attacks.

Still, the nature and cause of its irritant properties is a problem of some difficulty. Even in our common species the action is sufficiently powerful to lead to the conclusion that, if it results from a secretion of the plant, it must be of a kind with which we are but imperfectly acquainted.

The boiled herb is a wholesome vegetable, and in this state it may even be used as a poultice without possessing any irritating properties, but rather the reverse. This seems to show that something is due to the mechanical structure of the nettle. Probably the exceeding sharp points of the bristles rankle in the wounds they have made; but be that as it may, every schoolboy can point to a remedy for the sting of a nettle—

> "Nettle in, dock out,
> Dock in, nettle out,"

is a charm, combined with the rubbing in of the juice of any species of Dock, which immediately gives relief.

Barnes, the Dorset Poet, has the following quaint lines upon this subject in the vernacular of the county:

> "The dock-leaves that do spread so wide
> Up yonder zunny bank's green zide,
> Do bring to mind what we did do
> At play wi' dock-leaves years agoo:
> How we,—when nettles had a-stung
> Our little hands when we were young,—
> Did rub 'em wi' a dock, and zing,
> '*Out nettl', in dock. In dock, out sting.*'"

Nettles have been used for various economic purposes; amongst others, that of paper making. In Dr. Syme's new edition of 'English Botany' we find the following note in reference to the Nettle:—"The common name of this plant, familiar to everybody, is said by Dr. Prior 'to have meant primarily that with which one sews; and it is, indeed, almost identical with *needle*. Applied to the plant now called so, it indicates that this supplied the thread used in former times supplied by the German and Scandinavian nations, which we know as a fact to have been the case in Scotland in the seventeenth century.' Westmacott says, 'Scotch cloth is only the housewifery of the nettle.' In Friesland also it has been used until a late period. Flax and hemp bear Southern names, and were introduced into the north to replace it."

An ally of the Nettles will be found in the common English plant known as Pellitory of the Wall—*Parietaria*

officinalis. This commonly grows in the mortar between stones or bricks in old walls. It was formerly in high repute as a medicine, especially as a diuretic and lithontriptic; and, according to Dr. Pereira, "by some practitioners it is still highly esteemed. It is used in calculus and other urinary affections, and also in dropsies. The expressed juice may be taken in doses of one or two fluid ounces; or the decoction (prepared by boiling ℥j of the herb in a pint of water) may be substituted. The extract has also been used. On account of a nitrate which the plant contains the extract is said to have taken fire in making it." If this latter statement be true, it will account for the powers of the plant.

The inquiring botanist will be interested in observing the irritability of the stamens, as when the nearly ripe anthers are touched with the point of a pin, the previously incurved filament falls back with a sudden jerk, the anther bursting and scattering its pollen all around.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of March, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Foot-and-mouth	...	28	...	...	28	28
Boulogne .	„	„	...	76	...	...	76	76
Bremen .	„	„	141	...	...	...	141	141
Bremerhafen .	Hull . .	„	...	21	...	...	21	21
„	Leith . .	„	2	12	...	...	14	14
Dunkirk .	Hull . .	Sheep-Scab .	...	1	...	...	1	1
„	London .	Foot-and-mouth	...	46	...	...	46	46
Hamburg .	Grimsby .	„	...	19	...	...	19	19
„	Hartlepool	„	31	15	...	...	46	46
„	Hull . .	„	154	52	...	...	206	206
„	London .	„	173	...	...	...	173	173
„	Middlesborough	„	9	...	...	...	9	9
„	Newcastle-on-Tyne	„	35	52	...	...	87	87
Rotterdam	Harwich .	Sheep-Scab .	...	1	...	...	1	1
„	„	Foot-and-mouth	1	...	...	...	1	1
„	Hull . .	„	1	...	...	...	1	1
„	Sunderland . .	Pleuro-pneumonia .	1	...	...	...	1	1
Total . .		Foot-and-Mouth	547	321	...	...	868	868
„ . .		Sheep-Scab .	...	2	...	...	2	2
„ . .		Pleuro-pneumonia .	1	...	...	...	1	1
Total . .			548	323	...	...	871	871

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 11th April, 1872."

CATTLE PLAGUE.

France has not materially improved its condition in respect of cattle plague since the report in our April number. In the north the malady continues to rage, to the great discomfort of Belgium. A fresh outbreak was reported early last month, near Havre, and more recently an outbreak occurred in Sedan (Ardennes). On one farm, near Havre, twenty animals out of forty-one, it is said, died in a few days. This statement entirely destroys the effect of the stereotyped remark, "The most energetic repressive measures have been adopted." According to our ideas, the only rational measure would have been the slaughter of the whole herd as soon as the outbreak of disease was detected.

The reports from Calais state that no case of plague has occurred in St. Pierre-les-Calais for several weeks; and in the Pas-de-Calais the disease is confined to one commune. Round Amiens the cattle plague only exists in the department of Somme.

The infected departments, according to the last return, are, Nord, eight communes; Pas de Calais, one commune; Seine-et-Oise, one commune; Somme, three communes. Owing to the cessation of the disease in St. Pierre-les-Calais, the mayor has seen fit to relax certain stringent measures which were considered necessary while it prevailed in the district.

Belgium has remained free from cattle plague since March 3rd, according to the official reports; but there have been isolated cases of disease which so far resembled the plague as to give rise to some aprehension.

One case was reported to have occurred at St. Denis-Westrem, but the *post-mortem* examination resulted in the detection of only some of the lesions of cattle plague, others being absent. The editor of the *Journal de la Société Agricole du Brabant*, in the number for April 21, makes the following remarks on the case.

As we suggested in our last number the alleged case of cattle plague reported at St. Denis-Westrem, Pre-de-Sand, is not confirmed. Our sanitary condition continues to be altogether satisfactory.

We should be glad to say as much of France; but the reports which we have received this week are not good. Cattle plague has reappeared in the arrondissement of Sedan (Ardennes). It is also known to exist at Vaux-Mouzon and at Puilly, close to the frontier of Luxembourg.

In the Department du Nord many communes are infected. The malady prevails to a disquieting extent in several places, in the arrondissements of Dunkerque, and Maerebrouck, which adjoins our territory. The plague is far from being stamped out in this department, and it is impossible that it should be otherwise when one sees the little care which is taken to arrest the propagation of the malady.

From most recent reports which we have received it appears that the most simple precautions for extinguishing the centres of infection and preventing the propagation of the disease are neglected.

In Poland cattle plague has increased to a serious extent, and we learn that in consequence of its prevalence in the Governments of Warsaw and Radom, all fairs and movements of beasts have been prohibited for the present.

FOOT-AND-MOUTH DISEASE.

It will be seen from the official return that foot-and-mouth disease is widely spread on the Continent. Animals affected with this disease have been landed during the last month from Antwerp, Rotterdam, Hamburgh, Bremen, Boulogne, Dunkirk, Copenhagen, Corunna, and Dantzic.

In Worcestershire and Lincolnshire there have been several fresh outbreaks of foot-and-mouth disease, but generally the malady is declining so far that it has ceased to be a subject of constant observation. From recent returns the disease would appear to be steadily on the increase in Norfolk.

PLEURO-PNEUMONIA.

This disease maintains its normal rate of prevalence in the country. There are thirty-six counties infected, and the centres of infection number about a hundred and twenty.

SHEEP SCAB.

Sheep-scab is reported to exist in Pomerania, in seven districts in the Government of Stettin, and three in the Government of Köslin.

Sheep affected with scab have also been landed in this country from Rotterdam and Dunkirk.

In Great Britain there are thirty-seven counties reported as infected. Between eight and nine hundred cases of the disease are alleged to exist in the county of Norfolk alone.

Facts and Observations.

Curious Affection of Horses in India.—Having seen in your paper (*The Field*) of March 23 a letter referring to a peculiar derangement of the urine to which horses in India are subject, I will endeavour, if possible, to throw some light upon the subject. I have, during service in India, seen several horses affected in the way mentioned by your correspondent, passing the urine without pain, but at the same time highly discoloured. Sometimes the whole of the urine passed would be discoloured, sometimes only a portion of it, and sometimes the first part would be of a natural colour and apparently healthy, whilst the end would be very much discoloured, and leaving a deposit presenting the appearance of small clots of blood, but all passed without straining or pain.

I may mention here that this derangement was said (in one case at least) by a veterinary surgeon, a gentleman of great experience, not to be hæmaturia.

I have not seen horses affected in this way except when in hard work, in training for races especially, and I have never seen or heard of an Arab so affected. I had always supposed it peculiar to Australians and stud-bred horses, Australians especially. I remember particularly one horse, an Australian, who was when in training very liable to it; if he had been kept out in the sun longer than usual, it almost always came on; but if he did his work early, and got home without being exposed to the sun, he was free from it.

The only cure for it is, I believe, a little rest, non-exposure to the sun, and slight change of diet together, with a dose or two of nitre; in fact, if the horse is not exposed to the sun, it will cure itself.

My notion of the cause is that the sudden and extreme heat of the sun, after the cold or comparatively cold night and morning, together with the highly fed and full-blooded

condition of the horse (gram, the usual grain, being extremely heating), acts upon the kidneys, and produces this abnormal condition.

Should you think my letter worthy of insertion, perhaps you will give it a corner in your paper. F. B. M.—*The Field.*

Adulteration of Carbonate of Soda.—The *Antwerp Journal of Pharmacy* calls attention to the practice of adulterating carbonate of soda by mixing with it a proportion of sulphate of soda. At first sight the admixture is not apparent, though the two salts differ essentially from each other, both in their crystallisation and the chemical properties. The fraud is one that may be easily detected by a chemist.—*Journ. de Pharm. d'Anvers.*

Chloride of Aluminium as a New Antiseptic.—The hydrated chloride of aluminium, to which Mr. John Gamgee has recently drawn the attention of medical men and of the general public, appears to be a valuable antiseptic. It is quite as potent as chloride of zinc or carbolic acid, and is at the same time non-poisonous, and devoid of unpleasant smell of every kind.

The most economical process for the preparation of the hydrated chloride of aluminium appears to be by double decomposition between sulphate of alumina and chloride of calcium (both of which are cheap commercial products). When solutions of these two salts are mixed together, sulphate of lime is formed, and appears as a precipitate, whilst the hydrated chloride of aluminium remains dissolved.

On allowing the aqueous solution to evaporate at a very gentle heat, and afterwards cooling, crystals of hydrated chloride are produced. If an attempt be made to drive off the water from the hydrated chloride by the application of heat, decomposition will take place. Hydrochloric acid is evolved under these conditions, and oxychloride of aluminium is formed, and, by pushing the process, alumina is obtained as the ultimate fixed product.—*Lancet.*

Manufacture of Alum.—An anonymous correspondent of the *Pharm. Journ.* gives the following brief outline of the manufacture of alum as carried on at Mr. Spence's works at Manchester and Goole, where 250 tons of this salt are turned out weekly:

The shale of the coal measures is calcined in long ridges, it is then put into iron vessels lined with lead, sulphuric acid from the chamber is then poured over it, and the mass allowed to digest at about 230° F. to 240° F. The temperature is

kept up by steam and ammonia vapour, which are blown in, and also by a small fire underneath the pans. When the solution is strong enough to crystallise, it is drawn off into large coolers, and there agitated to prevent the formation of large crystals; the alum-flour so obtained is washed and redissolved by steam, and the solution run off into crystallising tubs, where it remains for ten days or a fortnight; the mother-liquid is then run off, and the alum is broken up, and is ready for the market.

A Confirmatory Test for Albumen in the Urine.—When urine gives, by heat and by nitric acid, a precipitate insoluble in this acid, there is evidence that it contains albumen. The author recommends the following confirmatory test to be applied in such cases. The precipitate is collected, well washed, and dissolved in a little potash. To this solution is added one or two drops of Barreswill's solution (*cupro-potassic tartrate*); a fine, rich violet colour is obtained, especially if the albuminous solution is somewhat concentrated. In this case it is not even necessary to apply heat to obtain the reaction, which, however, is required if the liquid only contains little albumen. The author states that this reaction is very characteristic.—M. Ludovic Bouland, *Journ. de Pharm.*

Application of Permanganate of Potassa.—The solution of this salt is readily decomposed by organic matter generally, and particularly by vegetable tissues. Some time ago Prof. Boettger found that this solution may be filtered through guncotton without decomposition; and recently he suggested the latter substance as suitable for applying the permanganate solution as an antiseptic in dressing wounds, ulcers, &c. This mode of application has proved eminently successful, the bad odour of suppurating wounds disappearing almost instantly.—*Amer. Journ. Pharm.*

Chilblains.—M. W. E. Schaller says that the fluid concentrated chloride of iron is an unfailing remedy for chilblains, its application to them for a single day effecting a cure. It may also be used with advantage in frost-bites.—*Wiener Medizinischen Wochenschrift.*

Antidote to Carbolic Acid.—Sweet oil or castor oil swallowed in large quantities is recommended as the most efficient antidote to carbolic acid, when it has been taken in poisonous doses.

Chloral and Strychnine.—Dr. Liebreich establishes a comparison between these two substances, in the

Berliner Kl. Woch., and finds that they neutralise each other. As the symptoms of poisoning by strychnine are very similar to those of tetanus, chloral would be a sovereign remedy for the latter, if its effects could be made to extend longer than the pathological irritation which gives rise to tetanus. Great improvement is, however, obtained by using the hydrate, as it seems to change the form of the complaint from the acute to the chronic, a change very likely to be followed by a cure. The salt should be given in the form of enema, and the dose may vary from 37 to 75 grains. Full doses should be given at once. Hypodermic injections are only exceptionally to be used, but the author states that his injections with the platino-iridium syringe never were followed by abscess.

WHITE OILS.—

1.—℞	Ol. Terebinthinæ . . .	℥v.	
	Ol. Lini	℥vij.	
	Sp. Camph.	℥ss.	
	Sp. Æth. Nit.	℥j.	
	Tr. Opii	℥j.	
	Mellis	℥ij.	M. s. a.
2.—℞	Ol. Terebinthinæ . . .	℥vj.	
	Liq. Vol. C. C.	℥vj.	
	Ol. Rapæ	℥vj.	
	Ol. Origani	℥iv.	
	Lin. Sapon.	℥ij.	

—*Pharm Journ.*

ADULTERATION OF LARD.—The author, having purchased some beautiful white lard, found it to contain a large proportion of lime. Mr. Shuttleworth was afterwards told by a lard renderer that it was a common practice among lard dealers to mix from 2 to 5 per cent. of milk of lime with the melted lard. A saponaceous compound is thus formed that is not only pearly white, but will allow of the stirring in, during the cooling, of 25 per cent. of water.—G. B. SHUTTLEWORTH, *Canad. Pharm. Journ.*

THE VETERINARIAN, MAY 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE OPENING OF THE SUMMER SESSION AT THE ROYAL VETERINARY COLLEGE.

Two months ago we referred to the establishment of a course of lectures and practical instruction in the summer as a desirable thing among the probabilities of the future. Now we speak of it as an accomplished fact, one indeed of several facts which have lately become patent in the institution. It has never been a part of our policy to disguise the defects in the system of veterinary education, and we have not hesitated to admit to our pages the strong expressions of opinion which have been advanced by the most radical reformers of our profession. On the contrary, we have more than once incurred the censure of our Continental friends on account of the amount of space which has from time to time been devoted to this subject. At length the matter has assumed another shape than that of talking or writing, and something has been done.

In our article in the March number of the *Veterinarian* we mentioned that the course of special clinical instruction which the profession has so persistently demanded had been determined on, that new facilities would be given to the more advanced students for the acquirement of practical knowledge in the hospital, dissecting-room, and chemical laboratory, and pharmacy, while the important subjects of operative surgery and shoeing would receive a due share of attention. It is scarcely necessary to guard ourselves against misconstruction in reference to the use of the words operative surgery. Even if no such institution as a Royal Humane Society existed, the authorities of the Royal Veterinary College would not be likely to sanction the horrors of the Alfort School; but we take occasion to express our conviction that

the practice of surgery on the dead subject, as proposed to be adopted, is at least as effectual as vivisection, for the acquirement of a knowledge of surgical anatomy and manual dexterity in the use of instruments.

The College offers ample scope for the special instruction in the practical duties of the profession which it is intended to give to the students, in completion of their studies, not merely to enable them to pass the practical examination in a creditable manner, but to fit them for their entrance into professional life.

In the laboratory, pharmacy, and dissecting-room there will be work to be done, and we venture to hope that means will be found to compel unwilling students to complete their due share of the allotted tasks; considering the short period of compulsory attendance at veterinary colleges, there is no room for idleness.

The new subject which has been introduced into the curriculum—botany—has to our recollection been under some sort of consideration at the College for a quarter of a century. And we may as well state the fact in plain terms, viz. that it has always been looked on by many of the students with disfavour, partly because it means something more to be learned, but chiefly because its true importance to the veterinarian is not understood. In medical schools botany is perhaps the most unpopular of all the subjects taught, and men of position in the medical world do not hesitate to record their testimony against it as a branch of medical education. But medical and veterinary students are very differently situated in reference to this subject—human patients do not feed on herbage, as equine, bovine, and ovine patients do; and it has never been suggested—in human, as it may be in veterinary practice—that some of the most important diseases have their origin in the soils and herbages on which animals are kept.

No veterinary surgeon who has the most elementary knowledge of botany would fail to express his opinion of its essential importance; and there are many who have had occasion to regret that the subject was not included in the curriculum years ago.

With the additions which have been made to the educational machinery at the College we may for the present rest content. But we are far from believing that all has been accomplished which the progressive spirit of the age demands. Extension of the period of study at all our veterinary schools is a necessity which is gradually becoming more urgent.

The general education of candidates for admission to the veterinary colleges may be fairly expected to keep pace with the requirements of the advanced code; but except through the medium of the matriculation examination the schools have no control in this matter. Considerable pressure, however, may be brought to bear upon the candidate by the College of Preceptors; and we shall hail with satisfaction the announcement that some knowledge of classics will be expected of the students who present themselves before that board.

Everybody is supposed to be desirous of giving his son an education which will aid him in getting on in the world; but we may remind fathers of the rising generation of veterinary surgeons that their object is not necessarily gained, and their responsibilities do not cease, when they have paid a fair fee to the schoolmaster. With some honorable exceptions the education which is given at private irresponsible schools is simply disgraceful, and after the discussions which have recently taken place on the subject no one in his right mind will be satisfied with the mere promises of a flourishing prospectus without some guarantee such as is afforded by the periodical visit of Government inspectors. It is absolutely cruel as well as unjust to send a youth who cannot read or write his mother tongue correctly to listen to the, to him, unintelligible language of science, and pursue a course of study the mysterious technicalities of which embarrass him at every step.

Extracts from British and Foreign Journals.

THE BROWN ANIMAL INSTITUTE.

Some years ago, a benevolent but apparently somewhat eccentric gentleman, Mr. T. Brown, of Dublin, left a considerable sum of money in the Funds to the University of London, for the purpose of providing an institution where animals (including birds) useful to man might be treated free of cost beyond the expenses of keep. A clause in the will limited the localities to any part within a mile of Westminster, Southwark, or Dublin; and, in the event of the establishment not being prepared for the reception of animals by a certain date (we believe the end of 1871), the whole amount was to revert to the University of Dublin for the purpose of founding a professorship of Sanscrit. At one time this terrible alternative appeared imminent; but, thanks to the efforts of the trustees, aided by several influential medical men, the more rational result has been achieved, and there is now in the Wandsworth Road an institution where diseases of the lower animals will not only be treated, but studied in a manner which has not been attempted before in this country.

During the many years which have elapsed since the death of the testator the money has accumulated to the sum of thirty thousand pounds, and to this some additions have been made.* Dr. Quain is understood to have given two thousand pounds towards the purchase of a site, and the trustees were fortunate in securing suitable premises at a moderate outlay; so that practically nearly the whole of the fund remains intact, furnishing a sufficient income for carrying out the most elaborate investigations, but leaving small margin for the payment of officers—whose love of research will, we presume, stand in the stead of liberal salaries. Dr. Burdon Sanderson is the

* The Brown Institution.—Sir,—In a description of the Brown Institution, given in *The Field* of March 30, it is mentioned that the sum of £2000 was contributed by Dr. Quain for the purchase of the site. Permit me to say that the sum of £2700 was contributed for this most useful and necessary object by Mr. John Cunliffe, of Lombard Street, and not by your obedient servant,

To the Editor of 'The Field.' Richard Quain.

professor superintendent; Dr. Klein is the chemical assistant; and Mr. Duguid, formerly of the Albert Veterinary College, is the veterinary professor, who will take charge of the infirmary, and assist in carrying on the experiments which Dr. Sanderson will originate.

The building stands on about an acre and a half of land, close to the Nine Elms goods station of the South-Western Railway. Two houses which were purchased with the land have been utilised as dwelling places for some of the officers, and two blocks have been added, one of which includes laboratories and studies, in which in future good work will doubtless be done. The arrangements are on the most extensive scale, and every possible appliance for carrying on chemical and pathological investigation will be brought into position as time and occasion may serve. Another block includes a *post-mortem* house, with convenient access from the road, a five-stall stable, some loose boxes, and a place where cattle and sheep may be kept; while at the further end of the ground there is a small building fitted up with hutches or cages for the accommodation of dogs. It is not necessary to criticise in detail these various divisions of the establishment —they will all answer their intended purpose as receptacles of animals; but we are bound to protect ourselves by the statement, the truth of which will be apparent to every practical visitor, that any one acquainted with horses and cattle could have suggested much more convenient arrangements, without encroaching any further upon the grounds or funds which were available for the purpose. As an infirmary for horses, cattle, and sheep, the institution would have no chance of success. Stock owners, as we know from experience, are much disinclined to send their sick animals to public hospitals; and the mere suggestion of experiments is enough to deter the most enthusiastic advocate of scientific research when his favourite hunter is the possible victim. We do not seriously mean that animals admitted for treatment will be made the subjects of experiments, but the vague apprehension of such a thing is sufficient; and it appears, from the stable arrangements at the Wandsworth Road establishment, that a well-filled infirmary is not among the contingencies provided for by the trustees. On the other hand, there is room enough for a few horses, half a dozen cattle, and half a score of sheep, which will suffice for the purpose of investigation. Some small dogs were the only patients we saw, unless we add sundry rabbits, evidently doomed for the benefit of science.

Our impression, after a careful examination of all the arrangements, was, and is, that the Institute will be used as a

field in which the investigations of the accomplished pathologist who has been placed in the position of superintendent will be carried out almost exclusively. As an infirmary or school it would have no chance in competition with existing veterinary institutions. Doubtless there will be painstaking students who will desire to avail themselves of the benefits which, when the details are all completed, will be within their reach at the new establishment, and it may come in time that a higher class of veterinary pathologists may take its rise from the Wandsworth Institute; but in the main the work will be that of investigation, which is to some extent incompatible with teaching.

The first step in recognition of the advantages which the new institute may be expected to confer on agriculture has just been taken— to us somewhat unexpectedly — by the Chambers of Agriculture, who have made, or propose to make, a grant of money in order that pleuro-pneumonia may be investigated in reference to its cause, treatment, and means of prevention. That there is a great deal to be done in this direction we do not question. Very little indeed is known about this destructive malady, beyond the bare facts of symptoms and morbid appearances; and we should be glad to learn precisely by what channels the infection is conveyed, how far inoculation is attended with specific or common results, and what measures may be put in force with a reasonable chance of extirpating the disease; but that a representative body of agriculturists should make a grant of money to an institution presided over by a physician, for the investigation of a disease affecting cattle, is a fine piece of irony, which we hope may not be altogether lost upon the heads of the veterinary profession.

One important clause in the testator's will we reserve to the last, on account of its essental public importance: the superintendent is bound to deliver at least five lectures annually free to the public. No one can doubt that Dr. Sanderson's remarks will be replete with valuable information and not less valuable suggestions on the subject of comparative pathology.—*The Field*, March 30, 1872.

REMARKABLE AFFECTION AMONG HORSES IN INDIA.

A CORRESPONDENT, who signs himself a "Patriarch," has sent us some particulars of a peculiar derangement of the urine, to which he says all classes of horses in India are liable. We quote from his description in the faint hope that some of our readers in that country, or who have had experience among horses there, will be able to give some intelligible explanation of a very mysterious malady. The writer in his account proposes to distinguish the derangement by the term "affection," instead of complaint or disease, for the reason that no mischief ever results, notwithstanding the serious aspect of the symptoms. We need scarcely say that no such distinction can be sustained. "Patriarch" writes:

"The urine is often passed to all appearance highly coloured with blood, very thick — so much so as to often leave a deposit on the bedding after the fluid part strains through; and this deposit to all appearance consists of small clots of blood. I feel I must here call on any one who reads this to curb their impatience and read on, as I shall try to show that this undoubtedly abnormal state of the urine is not the disease described and known as hæmaturia. The condition of the urine, as I describe, is at first naturally alarming; but when one has come to see it constantly and unquestionably unaccompanied by the symptoms or results of the above disease, apprehension gradually disappears. In stating there is no straining or any symptom of pain, the urine is voided quite naturally, and with all the signs of satisfaction which usually accompany the act when performed under the healthiest conditions; but I have noticed the colour vary; sometimes the first jet would be deeply coloured, the colour then cease, and the rest of the urine pass off to all appearance perfectly natural; jets of coloured urine sometimes succeed each other at intervals, even when passing in an even stream; while at other times the urine is voided until almost exhausted, and finished with a jet deeply coloured. All these variations occur irregularly and involuntarily. The affection occurs at all seasons, both after hard work and when horses are comparatively idle. In my experience it is seen most in well-conditioned, highly-fed, and full-blooded animals; but then my observation has been confined to this class. I do not say so in a boastful spirit, but the poorer-fed animals are rarely met with in India, except in such situations and of such class as don't invite the attention of persons not much interested in them. The affection is common to all horses (I mean

both those imported and country-bred alike), but I may add that I have never observed it in a mare; yet here, too, my experience is limited. From having seen the affection occur and recur in numerous horses during an experience extending over several years, apparently unattended in a single instance with pain or the injurious results to be looked for from the disease, I hope I may assume that what I describe is not hæmaturia. The question naturally follows, what is it? Just what I want to know. I have asked several veterinary surgeons with whom I have been on terms of intimacy, but without obtaining definite information, although I know it would willingly have been given. One veterinary surgeon attributed the affection to the colouring matter in gram, the pulse upon which horses are almost invariably fed in India. This definition satisfied me for the time being; but I since began to ask myself why the water, in which the gram is steeped in most well-managed stables, does not pour off thus coloured. I admit it is so slightly, but not to such an extent as would support the inference, and the colouring is, in my judgment, far more due to the dirt mixed with the gram than any extract from its husk. I maintain, too, that the inference is completely upset by the existence of the deposit which I described. Except the above, I never knew any European assign a probable cause for the affection, or even try to ascertain its real cause. Many men, too, may say, since I describe it as so harmless why trouble oneself about it? I only assert that it has fortunately proved so within my own experience, and I also assert that it indicates a sufficiently deranged condition of some important organ to make the subject worthy of professional inquiry. Natives, although accustomed to view it with habitual indifference, will go through the semblance of treatment. They refer almost all complaints to one or other of two habits of body, viz. cold and hot, for both of which conditions all natives who have charge of animals possess many nostrums, or, as they are familiarly known, musalahs—for that matter, many Europeans too—and all alike of reputed undoubted efficacy. The affection I describe being of the habit "hot," is treated with a cooling (literally cold) musalah, a popular one being composed of garlic and buttermilk, with perhaps the addition of some equally efficacious ingredient—alum, nitre, all come alike.

"When unaccustomed to the affection, I was, as a matter of course, startled, tried sedatives, and watched for symptoms. I have also given diuretics and alteratives in the form of nitre, of resin, sulphur, sulphate of antimony, accompanied

with tonics in the shape of gentian, quinine, and sulphate of iron. I never remarked effects on the urine which I could fairly attribute to this treatment, and I now leave the naturally hardy constitution of the horses which I use (Arabs) to the *vis medicatrix naturæ*.

"Since commencing this note a disease peculiarly Indian. and which I have never seen noticed in veterinary books, occurs to my mind. It is known as 'bursatee,' and is so called from generally attaeking the subject in the rainy season. It consists of sores which break out on the animal, and are not confined to any particular situation. There is little local inflammation, but distinct symptoms of fever, ascribable to the sores alone. These latter are obstinate to a degree, I believe, quite unknown in Europe. However, I may well add that in the rains all sores are obstinate, and wounds are liable to assume an unhealthy character—I mean will not yield to treatment; bursatee is peculiarly so. In Europe most men would attribute disease of this nature to bad stable management, defective ventilation, or something calculated to foul the system. As a rule, this will not apply in India to the same extent as in Europe. The disease is peculiar among animals to horses. I am not nearly qualified to decide, but I think there is a great similarity between bursatee and Delhi sores; the latter peculiar to the human subject. The point of most difference is, that one attacks the human subject almost always in the hot weather, when the system is most reduced; and the other almost invariably appears in the rains. Both alike run their course, giving way, like most other Indian complaints, to no treatment so much as complete change of climate and food. Gram, the almost invariable food of the horse in India, is undoubtedly more heating than the cereals more in use elsewhere, and accordingly the system is in an unfavorable state to deal with a disease, while the moisture aggravates the obstinacy of the sores; yet I believe sufficiently in medicine to hope that its effects are not quite dependent on auxiliaries not always available.

"My own experience of bursatee is very limited, and my treatment confined to dressing the sores with carbolic acid and glycerine, mixed in various proportions, with free use of sulphate of iron as a tonic, with such nourishing food as was procurable, viz., gram, bran, and barley. I have found but little immediate benefit from this: but when the sores heal, which they almost always do with the change of season, provided the animal survives so long, then the effects of the tonic are very striking.—*The Field*, March 23, 1872.

THE RECORDS OF CONTAGIOUS CATTLE DISEASES IN YORKSHIRE DURING THE YEARS 1870-71.

By J. Dent Dent, M.P.

[*A Letter to the Editor of the 'Royal Agricultural Society's Journal.'*]

My dear Sir,—It has occurred to me that some readers of the Journal might be interested in the records of contagious diseases amongst animals in Yorkshire, which have been collected by the county constabulary since the carrying out of the provisions of the Contagious Diseases (Animals) Acts, 1869, was placed in their hands. Through the courtesy of Lieutenant-Colonel Granville Layard and Captains Hill and McNeill, the respective heads of the force in the East, North, and West Ridings, I am enabled to send you the quarterly returns of cases of pleuro-pneumonia and foot and mouth disease for the last two years. You will see that, as a whole, the East Riding, which is the most purely agricultural part of the county, has suffered the least, although the port of Hull, to which many German cattle are sent, is situated within it. This fact appears to negative the idea that the spread of these diseases or their virulence is proportionate to the introduction of foreign animals. The West Riding has suffered the most; this may be attributable partly to the fact that there was a great amount of foot and mouth disease existing in this Riding when the Act was first put into operation, and still more that the West Riding fairs are the great fairs for Irish cattle.

Skipton, Knaresborough, Wetherby, and Wakefield, all have large fortnightly lean stock markets, which, especially during the autumn, are crowded with Irish beasts, many of most excellent quality, and invaluable for the use of our graziers; but others, much over-driven, overcrowded on shipboard and in railway trucks, and half starved in their progress from the Irish coast, are almost certain to be affected with disease either at the fair or on their arrival at the farms for which they are purchased. The North Riding, and the West too, alike suffer from the great focus of disease in Yorkshire, the market at York. This fortnightly market is at certain seasons crowded with stock, principally imported from Ireland, and from this centre the foot and mouth disease has at all times extended throughout the grazing districts of Yorkshire, as also did the cattle plague some years ago. There is need of a far more effective supervision of fairs, and a more general

sense of the inconvenience caused by foot and mouth disease to farmers themselves, before any real progress will be made in checking it. At present, many farmers who purchase Irish grazing cattle each autumn, intending to winter them on straw and turnips, and sell them out fat from grass in the ensuing year, consider it almost a matter of course that their cattle will have this epidemic; and they desire to get it over as early as possible, before the beasts gain flesh. If the epidemic does not attack them until they are nearly fat, there is a loss of a month or six weeks' grazing; but if they are affected soon after their arrival the loss appears trivial, the attack seldom lasting more than ten days. The returns, I think, will show that the disease seldom terminates fatally, the loss from death amongst cattle being trifling, and amongst sheep almost infinitesimal.

On the other hand, pleuro-pneumonia is as fatal as ever; and from the returns we may conclude that 50 per cent. of the animals attacked by this disease fall victims to it. I feel satisfied that immediate slaughter will always be found the best resource for the farmer whose stock is affected, even if there be no compensation awarded, as the flesh of the animal when first attacked is not generally considered to be unfit for food,* and the chance of recovery is most uncertain. I am, however, very much inclined to believe that if all animals suffering from pleuro-pneumonia were slaughtered as soon as they were attacked, and if a reasonable compensation were made to the owner, this disease might soon be eradicated, supposing the system to be universally and compulsorily carried out. At present different local authorities take different views of the best course to pursue, and there is not sufficient uniformity in their proceeding.

We find that in 1870, in the East Riding of York, out of 73,575 cattle, only 6 died from foot and mouth disease, and none from pleuro-pneumonia. In the North, out of 143,730, 100 died or were killed in consequence of foot and mouth disease, and 30 in consequence of pleuro-pneumonia. In the West, out of 220,986, 117 died or were killed on account of foot and mouth disease, and 148 on account of pleuro-pneumonia, so that out of 438,291 cattle, 401 died from these

* Since writing the above, I find that the Local Government Board have introduced the "Public Health Bill," which proposes to enact, in clauses 44 and 45, that "all milk of any animal suffering from any contagious or infectious disease, as defined by the Contagious Diseases (Animals) Act, 1869, or from any tubercular disease, shall be deemed unwholesome and to be unfit for the food of man, and that any person selling for human food any animal, carcase or meat, so diseased, shall, on conviction, pay a penalty not exceeding £20.

diseases, being about one in 1000. In 1871, in the East Riding, the losses from foot and mouth disease were, 18 from pleuro-pneumonia, and 20 from foot and mouth disease, out of 72,406; in the North, 57 from pleuro-pneumonia, and 61 from foot and mouth disease, out of 140,220; in the West, 81 from pleuro-pneumonia, and 113 from foot and mouth disease, out of 217,088; making a total loss from both diseases of 340 out of 429,714, being a rather more favorable return than for 1870, in spite of the widespread outbreak of foot and mouth disease in the autumn of that year. On the whole, therefore, I cannot but hope that the Acts are working satisfactorily, when I compare this loss with the losses which occurred under my own personal observation before the days of the cattle plague, when the restrictions at that time in force very nearly freed us from all other cattle diseases.

I am truly yours,

JOHN DENT DENT.

RIBSTON HALL, 21*st January*, 1872.

RETURNS, *showing the Progress of* PLEURO-PNEUMONIA *Quarterly in the North, East, and West Ridings of Yorkshire under the Constabulary, between January* 1, 1870, *and December* 30, 1871.

DATE.	EAST RIDING.			
	Attacked.	Killed.	Died.	Recovered.
Quarter ending March, 1870 . .	Nil.	—	—	—
,, June, ,, . .	Nil.	—	—	—
,, Sept., ,, . .	Nil.	—	—	—
,, Dec., ,, . .	Nil.	—	—	—
,, March, 1871 . .	Nil.	—	—	—
,, June, ,, . .	Nil.	—	—	—
,, Sept., ,, . .	22	12	—	10
,, Dec., ,, . .	8	6	—	2
Totals . .	30	18	—	12

RETURNS, *showing the Progress of* PLEURO-PNEUMONIA *Quarterly in the North, East, and West Ridings of Yorkshire under the Constabulary, between January* 1, 1870, *and December* 30, 1871—continued.

DATE.	NORTH RIDING.			
	Attacked.	Killed.	Died.	Recovered.
Quarter ending March, 1870 . .	—	—	—	—
„ June, „ . .	24	3	10	11
„ Sept., „ . .	31	2	9	20
„ Dec., „ . .	13	—	6	7
„ March, 1871 . .	23	4	9	10
„ June, „ . .	38	2	23	13
„ Sept., „ . .	27	1	16	10
„ Dec., „ . .	12	2	—	7
Totals . .	168	14	73	78

DATE.	WEST RIDING.			
	Attacked.	Killed.	Died.	Recovered.
Quarter ending March, 1870 . .	65	28	17	15
„ June, „ . .	88	19	28	32
„ Sept., „ . .	46	18	20	20
„ Dec., „ . .	35	11	7	18
„ March, 1871 . .	29	11	6	4
„ June, „ . .	39	17	7	23
„ Sept., „ . .	29	8	10	8
„ Dec., „ . .	28	16	6	9
Totals . .	359	128	101	129

RETURNS, *showing the Progress of* FOOT AND MOUTH DISEASE *Quarterly in the North, East, and West Ridings of Yorkshire under the Constabulary, between January* 1, 1870, *and December* 30, 1871.

DATE.	EAST RIDING.			
	Attacked.	Killed.	Died.	Recovered.
CATTLE.				
Quarter ending March, 1870	973	—	3	970
,, June, ,,	238	—	—	238
,, Sept., ,,	1,386	—	3	1,383
,, Dec., ,,	988	—	—	988
,, March, 1871	265	—	—	265
,, June, ,,	73	—	—	73
,, Sept., ,,	1,279	—	3	1,276
,, Dec., ,,	3,640	—	7	3,633
Totals	8,842	—	16	8,826
PIGS.				
Quarter ending March, 1870	105	—	9	96
,, June, ,,	16	—	—	16
,, Sept., ,,	124	—	2	122
,, Dec., ,,	119	—	11	108
,, March, 1871	35	—	2	33
,, June, ,,	9	—	6	3
,, Sept., ,,	184	—	21	163
,, Dec., ,,	637	—	4	633
Totals	1,229	—	55	1,174
SHEEP.				
Quarter ending March, 1870	1,321	—	2	1,319
,, June, ,,	20	—	—	20
,, Sept., ,,	51	—	—	51
,, Dec., ,,	1,003	—	—	1,003
,, March, 1871	353	—	—	353
,, June, ,,	—	—	—	—
,, Sept., ,,	46	—	—	46
,, Dec., ,,	9,538	—	1	9,537
Totals	12,332	—	3	12,329

RETURNS, *showing the Progress of* FOOT AND MOUTH DISEASE *Quarterly in the North, East, and West Ridings of Yorkshire under the Constabulary, between January* 1, 1870, *and December* 30, 1871—continued.

DATE.	NORTH RIDING.				
	Attacked.	Killed by Owner.	Died.	Recovered.	Under treatment.
CATTLE.					
Quarter ending June, 1870 .	1,104	—	7	1,097	—
,, Sept., ,, .	7,489	4	79	7,406	—
,, Dec., ,, .	1,538	—	10	1,528	—
,, March, 1871 .	1,309	—	7	1,302	—
,, June, ,, .	480	—	5	475	—
,, Sept., ,, .	7,080	2	32	7,046	—
,, Dec., ,, .	6,441	—	15	5,389	1,037
Totals . .	25,441	6	155	24,243	1,037
PIGS.					
Quarter ending Sept., 1870 .	396	—	11	385	—
,, Dec., ,, .	—	Nil.	—	—	—
,, March, 1871 .	224	—	9	215	—
,, June, ,, .	228	—	—	228	—
,, Sept., ,, .	245	—	35	210	—
,, Dec., ,, .	531	—	5	431	95
Totals . .	1,624	—	60	1,469	95
SHEEP.					
Quarter ending Sept., 1870 .	118	—	—	118	—
,, Dec., ,, .	—	—	—	—	—
,, Sept., 1871 .	1,460	—	—	1,460	—
,, Dec., ,, .	2,274	—	—	1,497	777
Totals . .	3,852	—	—	3,075	777

RETURNS, &c.—*continued.*

DATE.	WEST RIDING.			
	Attacked.	Killed.	Died.	Recovered.
CATTLE.				
Quarter ending March, 1870	7,053	21	37	6,458
,, June, ,,	4,459	5	33	4,776
,, Sept., ,,	4,402	2	15	3,888
,, Dec., ,,	2,424	—	4	2,808
,, March, 1871	1,475	—	3	1,683
,, June, ,,	691	1	3	737
,, Sept., ,,	8,540	2	41	6,642
,, Dec., ,,	9,951	6	57	11,030
Totals	38,995	37	193	38,022
PIGS.				
Quarter ending March, 1870	555	7	33	509
,, June, ,,	106	—	2	114
,, Sept., ,,	154	—	4	135
,, Dec., ,,	237	—	18	231
,, March, 1871	87	—	—	90
,, June, ,,	51	1	—	49
,, Sept., ,,	706	—	18	579
,, Dec., ,,	986	—	28	1,030
Totals	2,882	8	103	2,737
SHEEP.				
Quarter ending March, 1870	708	—	8	689
,, June, ,,	23	—	—	34
,, Sept., ,,	114	—	—	85
,, Dec., ,,	105	—	—	100
,, March, 1871	125	—	—	159
,, June, ,,	—	—	—	—
,, Sept., ,,	276	—	—	122
,, Dec., ,,	3,194	1	—	2,510
Totals	4,545	1	8	3,699

INTERIM REPORT ON VETERINARY INVESTIGATIONS.

By Professor James Beart Simonds, Veterinary Inspector of the Society.

[*Extracted from the 'Journal of the Royal Agricultural Society.*]

I. *Feeding Experiment with Hardon's Patent Feeding Cake.*

This experiment, which may be designated No. 1, was undertaken in consequence of the Marquis of Exeter having lost a young bull, 10 months old, and also a valuable short-horn cow, under circumstances which led to the impression that the cake supplied to them was probably the immediate cause of death. Both the animals had died very suddenly, while being fed for exhibition at the Society's annual show. Three pigs, also, which partook of some of the same cake, but only in small quantities, died at about the same time. All the animals presented the same morbid appearance on a *post-mortem* examination.

Neither a chemical nor microscopical examination led to the detection of anything of a poisonous nature in the specimens of cake examined. They were, however, of inferior quality, and appeared to have been greatly deteriorated by long keeping.

May 6th, 1871.—A healthy young heifer, about a year old, was selected for the experiment, and placed by herself in a loose box; water and hay, in ordinary quantities, being given to her, in addition to the suspected cake.

The quantity of cake supplied was 1 lb., and the same amount was allowed per diem for three consecutive days. On the fourth and fifth days, 2 lbs. each day were given; after which the animal partook of 4 lbs., for four days; 6 lbs., for six days; and 8 lbs., for two days; making a total of 75 lbs. in seventeen days.

On the evening of the fifth day of the experiment the heifer had an attack of indigestion, accompanied with tympany of the abdomen. This, however, passed off naturally, and by the following morning she appeared to be in her usual state of health. On the evening of the sixteenth day, after partaking of 8 lbs. of cake, she exhibited symptoms of serious illness; but towards evening she rallied a little. On the next morning, however, a relapse took place, and within little more than an hour she died. No treatment was adopted.

The *post-mortem* examination, which was made as early after

death as possible, showed all the usual indications of blood-poisoning from deleterious food to be present, to a greater or less extent, in the several organs of the body. Venous congestion existed everywhere, the blood being black in colour and only imperfectly clotted. The abdomen contained a quantity of dark-coloured serous exudation. The rumen and other stomachs were distended with gaseous products, but their structure did not seem to have suffered. The intestines throughout presented an ecchymosed condition of the mucous membrane, the small ones containing, in addition, a large quantity of blood-coloured, semi-fluid exudation-matter. The spleen was filled to repletion with black blood, and the liver and kidneys were similarly affected. The lungs were also in a congested state; their structure, however, was normal. Extravasations of blood, small in amount, had taken place into the substance of the heart, as also beneath the lining membrane of the auricles and ventricles, particularly of the left ventricle.

On the result of the experiment being reported to the Marquis of Exeter, his Lordship communicated the circumstance to the Council of the Society, when some members appeared to think that the death of the animal was rather due to the quantity of the cake partaken of than to anything deleterious which it might have contained. It was therefore determined to have recourse to some other experiments of a like kind with Hardon's cake, and to contrast these experiments in feeding other young animals with large quantities of pure linseed cake. For this purpose two heifers—each about 10 months old—were selected, and three pigs, between three and four months old. A fresh supply of Hardon's cake was obtained for the experiments from the Marquis of Exeter.

II.—*Second Experiment with Hardon's Cake.*

July 17th, 1871. *Heifer A.*—2 lbs. of cake, in addition to other food of the ordinary description, were given to this animal. It was readily partaken of. On the 18th, 19th, 20th, and 21st, the same quantity was allowed on each day. On the 22nd, 3 lbs. were given, and repeated for three consecutive days. During the four following days, 4 lbs. were allowed; and on the 29th and 30th, 5 lbs. On the 31st, 6 lbs. were given, and continued daily to August 3rd. On August 4th the quantity was increased to 7 lbs., and subsequently repeated day by day in this proportion throughout

the month of August, and down to September 7th, when the experiment ceased.

During the entire time the animal did not appear to have its health impaired, beyond an occasional slight attack of indigestion. Its general condition, however, was but little improved; the inference being that the cake possessed only moderate feeding qualities.

III.—*Linseed Cake.*

This cake was of the best quality.

July 17th. *Heifer B.*—2 lbs of cake were added to the food of this animal, which was of the same kind as that supplied to *Heifer A.* As in the other case, no increase was made in the quantity of the cake until July 22nd, when 3 lbs. were given and continued for the three following days. On the 26th the quantity was raised to 4 lbs., at which rate it was supplied for the four following days, when it was increased to 5 lbs. Two days subsequently it was raised to 6 lbs., and on August 4th to 7 lbs. Throughout the remaining part of the month, and down to September 7th, when this experiment also ceased, the animal was supplied with 7 lbs. daily. During the entire period the animal continued in perfect health. No loathing of food was at any time produced, nor any disturbed condition of the bowels. It was observed that she grew rapidly, and maintained a thriving appearance.

The result of these experiments would seem to negative the opinion that the death of the heifer, the subject of the original experiment, was due to the quantity of cake of which she partook, and that it most likely depended on that *special* lot having undergone some peculiar change, due probably to long-keeping. It has often been noticed that oil cake when old is not merely deteriorated in feeding properties, but that it is really dangerous to the life of animals. The development of microscopic fungi has been assigned as the cause of this, and probably with much correctness; but in the present state of science it is scarcely safe to speak other than hypothetically on the point.*

IV.—*Feeding Pigs with Hardon's Cake.*

July 19th, 1871.—A three-months-old pig was supplied with ½ lb. of Hardon's cake, mixed with some wetted bran

* See the 'Annual Report of the Consulting Botanist,' p. 211.

and corn—chiefly oats. This quantity was given daily for three days, when it was increased to 1 lb. In three days more it was again increased, the quantity now being 1½ lb.; at which rate it was continued down to July 29th, an occasional attempt being made to induce the animal to take a larger amount, but without success. Indeed, throughout the experiment, the animal showed very little relish for the cake, but would eat other food most readily.

On July 29th a second pig of the same age was placed with this one, and 3 lbs. of cake supplied to the two animals. It is necessary here to observe that this pig had been fed with another one, from July 21st to the 29th, on linseed cake, in addition to its ordinary food.

From July 29th to August 7th inclusive, the quantity of Hardon's cake was kept at 3 lbs. daily. It was now raised to 4 lbs. On the second day afterwards, the animals refused to take their food, excepting in small quantities, and did not consume more than 2 lbs. of the cake daily for the next four days; but otherwise their health did not seem to be affected. On August 13th they again partook of 3 lbs., and, within a day or two, of 4 lbs.; more than this, however, they could not be induced to eat. With a daily supply varying from 2 lbs. to 4 lbs., the experiment was continued down to September 30th, when it ceased.

As in the case of the heifer fed with Hardon's cake, these pigs did not much improve in condition, nor grow so well as might have been expected.

V.—*Feeding Pigs with Linseed Cake.*

The cake used in this experiment was the same as that supplied to the *Heifer B.*

At the commencement of the experiment on July 21st, two pigs, three months old, were supplied with 2 lbs. of linseed cake, in addition to their other food. It was readily partaken of.

On July 25th the quantity was increased to 4 lbs., and continued for three days, when their appetite palled, and they would not take more than about half the quantity named.

On July 29th one of the animals was removed and placed with the pig which was being fed with Hardon's cake.* Here it remained until the end of the experiment. The re-

* See Experiment IV.

maining pig was fed with linseed cake throughout the month of August and down to September 10th, when the use of the cake was discontinued. Its relish for the food was very variable; thus, for a day or two together it would readily eat 2 lbs., and sometimes 2½ lbs. of cake; while on other days it could scarcely be tempted to take half the quantity. Notwithstanding this, the animal thrived well, and at the end of the experiment was in excellent condition, contrasting favorably in this respect with the pigs fed on Hardon's cake.

These experiments of feeding pigs fully confirm the conclusion arrived at in the case of the heifer, as to the non-existence of anything positively poisonous in Hardon's cake. They also confirm the deduction that linseed cake given in the same proportion to the other food of the animals is a better feeding material than the samples of Hardon's cake supplied for the experiments.

VI.—*Disease of Lambs.*

With reference to the resolution of the Council, at its meeting on November 1st, 1871, relative to the serious losses which many farmers had sustained, especially in Lincolnshire, from disease among their lambs, I have to report that the investigation, then ordered by the Council, has been carried out as far as the period of the year would permit. The disease alluded to has long since attracted attention, and from time to time engaged the investigations of scientific men. Essentially the affection is due to the existence of matured parasitic worms within the bronchial tubes of the lamb, which ultimately produce structural disease of the lungs of the animal, by the myriads of young worms to which they as parents give birth. Of late years the disease has been largely on the increase, from causes which are but imperfectly understood, and which it would seem can only be elucidated by further investigation into the natural history of the worm. So far as the structure and means of direct propagation of the parasite are concerned, here appears to be but little to add to our present knowledge. The researches into its natural history, as far as they have gone, would, however, seem to lead to the conclusion that the young, or embryotic, worms are fitted for propagation of their species to a great extent rather out of than within the air passages of the animal.

Indeed, it may hereafter be shown that it is essential to the ultimate sexual development of the worms, that in their

immature condition they should become parasitic to some of the grasses, natural and artificial, on which the lambs are fed at the time of being attacked. With a view to assist in this part of the inquiry, I have asked for and received portions of turf cut from meadows on which diseased lambs had been pastured. These turf-cuttings have been supplied by two members of the Lincolnshire Committee, and will, as soon as the season is more advanced, be subjected to a searching microscopical examination.

With the same object in view, a series of questions—see Addendum—has been drawn up and forwarded to the Secretary of the Lincolnshire Society for circulation among the members. In due time they will be answered and returned to me for analysis and deduction.

It may further be remarked that, as negative evidence may not unlikely prove of great value in the inquiry, I have repeated an experiment—some years since adopted by me—namely, that of conveying the ova of the worm, and also embryotic worms obtained from the lungs, directly into the air passages of a lamb.

On former occasions, experiments of the kind have invariably had a negative result; and the present one does not promise any other, as the lamb—the subject of the experiment—appears to continue in perfect health. The introduction of the ova and young worms has been twice had recourse to: first, on October 24th; and secondly, on November 17th, 1871. An inquiry of this kind must necessarily occupy much time and attention, and probably the carrying out of numerous experiments on selected farms, as well as within an institution like the Royal Veterinary College. The subject, however, will receive every attention, and no time will be lost in its further investigation.

February 1*st*, 1872.

[*Addendum.*]

Royal Agricultural Society of England.

LAMB DISEASE.

List of Queries prepared by Professor Simonds, to which an early reply is respectfully solicited by the Lamb Disease Committee of the Lincolnshire Agricultural Society.

1. How long has the Farm been in your occupation?
2. What are the general characters of the soil and subsoil?
3. What is the relative proportion of Meadow to Arable Land?
4. Is the Farm wet, or dry; partially, or wholly drained?
5. State the system of husbandry with regard to the rotation of Crops.
6. Is the Meadow Land liable to flood?
7. Are the Meadows mown and fed in alternate years, or mown yearly and the after-grass fed with sheep?
8. Do sheep contract rot on the Farm?
9. For how many years have you been familiar with the "lung-worm disease" on your Farm?
10. How many breeding Ewes are kept?
11. What is the general management of the Ewes, especially as to varieties of food supplied to them, from the time they are put to the ram to the period of lambing?
12. State the system which is adopted with regard to the other sheep on the farm, and especially with reference to the lambs being sold either fat or as store stock?
13. What custom prevails with regard to stocking the farm with sheep either for breeding or feeding?
14. At what date are the lambs dropped, and when weaned, as a rule?
15. After lambing how are the Ewes and Lambs fed and managed until weaning time?
16. Have the lambs ever been known to be diseased if, after

being weaned, they have been kept *exclusively* on permanent pasture down to the end of the year?

17. If affected on permanent pasture has the custom been to mow such pasture and feed the after-grass, or to feed throughout the summer?

18. At what period of the year have the first indications of the lambs being unhealthy been observed?

19. Has the state of the weather influenced the attacks, and, if so, in what manner?

20. Has the disease prevailed more or less every year, or have there been years of freedom from it?

21. If the disease has been on the increase of late years, to what cause is it attributed?

22. When the lambs have gone apparently healthy from permanent pasture to rape, mustard, or other green crop of that year's produce, have they suffered from the disease?

23. On what evidence has reliance been chiefly placed that the lambs, which subsequently showed symptoms of the disease, were in a perfectly healthy condition when removed from permanent pasture to crops not previously fed with sheep?

24. Supposing layers are fed with sheep and allowed to stand over for feeding again in the following year, have the lambs pastured thereon been early attacked or not?

25. Has it been observed that lambs which are grazed during the summer on seeds that had not been previously stocked with sheep, contract the disease?

26. When the lambs are unmistakably diseased, on what part of the farm, and on what food in particular, have they been afterwards kept?

27. What symptoms do you deem to be characteristic of the disease?

28. How long a time usually elapses between the first indications of disease and death?

29. Does scouring—diarrhœa—exist in all cases before death?

30. What are the percentages of deaths over recoveries, or *vice versâ*?

31. Have you found any means by which the disease is kept in check or even partially prevented?

32. Are any calves reared on the farm, and, if so, do they suffer from the disease called "hoose" or "husk?"

33. Have apparently healthy lambs, which had been reared with those that were diseased, been kept as stock-sheep for use during the following or succeeding years?

Signed,_____

A Member of the Lincolnshire Agricultural Society.

Date, *March*, 1872.

This list should be returned to the Secretary of the Lincolnshire Agricultural Society *before the 25th of March*.

"FIRING" HORSES.

APPLYING a red-hot iron to the surface of the body for the cure of certain diseases or injuries is a very ancient surgical remedy, and one of undoubted efficacy in certain circumstances. Its beneficial employment in veterinary and human surgery has long been recognised, and in particular cases it is very questionable if any other remedy would be productive of so much relief. It would be out of place in a journal like the *Animal World* to discuss the *modus operandi* of the actual cautery; but the painfulness of the operation, the best means of annulling or ameliorating that pain, and the question as to whether "firing" is not more frequently resorted to than is at all necessary, are, I think, subjects quite within its scope, and may be advantageously discussed in its columns.

It is questionable whether the application of the hot iron to a horse's skin, in the way it is usually applied by a well-instructed veterinary surgeon, induces such intense pain as those unaccustomed to perform operations on the animal would imagine. If the iron is very hot—bright red tint is proper—and the operator's hand light and steady, the burning sensation is not nearly so acute as when the instrument is at a lower temperature, and consequently darker

coloured. I have frequently "fired" horses without throwing them down, or restraining them, beyond having one of the limbs held up by a powerful assistant; and I am sometimes quite astonished at the small amount of irritation a few lines with the iron produces. It will be in the experience of many that no burn is so painful as that caused by a piece of metal at a black heat; whereas, when nearly white hot, the iron carbonises the superficial part of the skin at once and destroys its sensibility. I have on a few occasions used a piece of iron at a high temperature to cauterise the wounds of persons who had been bitten by dogs suspected of rabies, and always found that the greatest pain experienced was generally in anticipating the operation. In "firing" a horse for some diseases, a blister is not, in my practice, applied over the burnt surface for some days; and I have noted that the animal experiences more pain and irritation from the vesicant than the cautery. This, I have no doubt, has been observed by every veterinary surgeon. Nevertheless, when more than one limb has to be "fired," and especially if a large surface has to be cauterised, it is advisable, in the majority of cases, not to do too much at a time; as when two or three legs are extensively operated upon at once the subsequent irritation may be severe. Under any circumstances, the skin should not be cut through; and though in sayiug this I am, perhaps, not quite in union with some other veterinary surgeons, yet I am confident that no further benefit is to be derived from the excess, while unsightly blemish and more intense pain will be the result. If "firing" is necessary, and a blister thought essential to complete the cure, the latter should not be applied until some days after the former; and a week at least should always intervene before another limb is blistered. Many horses have died from the great nervous disturbance and irritative fever set up by blistering more than one leg at a time. Of course, I am now speaking of such extensive surfaces as the whole of the extremity, from the knee or hock downwards, being involved in this medication.

With regard to annulling or alleviating the pain attending the operation of "firing," there can be no doubt whatever that every veterinary surgeon must be sincerely desirous, both on the score of his own safety as well as through a feeling of sympathy with the poor beast to be operated upon, that no suffering shall accrue. Veterinary science is nothing if it is not based upon humane principles; and no class of men should be more deeply imbued with the spirit and the impulses of humanity than veterinary surgeons. Their

science has the comfort, longevity, and well-being of the dumb creatures around us for one of its objects; while its chief and most sacred aim is the prevention, mitigation, or cure of those maladies which torment these animals, and which are so frequently brought upon them by the neglect, ignorance, or cruelty of their owners, or are incurred while toiling for them. No veterinary surgeon deserves the designation who is not actuated by the spirit that ennobles his profession; and whoever can realise what the medicine of the domesticated animals was in this country less than a century ago, and knows what it is now, will gladly confess that science has done wonders for these creatures, and has rescued them from the ignorant and cruel "doctoring" of the cow-leech and the farrier.

The discovery of the anæsthetic properties of chloroform was looked upon, at first, as almost as great a boon to the lower animals as to man himself, and it was extensively employed. But it was soon found that, except in special cases, its use was limited. In the first place, a horse about to be submitted to an operation must be thrown down in the ordinary way before the administration of the chloroform can be attempted—for no animal will stand, neither can man, while under its influence; and there being always a preliminary stage of excitement before loss of consciousness, to try to make a horse inhale this drug while standing would be the height of folly, as it might cause serious accidents. Therefore it is absolutely necessary that the animal be cast, and the chloroform administered by an experienced assistant, as in the case of a human being. This requires some time, and then the operation is performed; after which the horse has to be recovered from its unconsciousness. Now it is scarcely necessary to point out that, however humane the veterinary surgeon may be, he would in but few cases elect to employ chloroform; and as "firing" is a simple operation, and does not, or should not, occupy many minutes, it would be making a much to-do about nothing to resort to it. In the matter of expense alone, which is generally a serious affair with owners of animals, chloroform would be objected to by many; then there is the time occupied in administering it, and the necessity for a skilled assistant, the risk of the animal dying from its effects, &c.

But to those who have employed this fluid in the lower animals, there is another drawback which goes a long way to counterbalance the temporary abolition of pain it occasions, and that is the marked depression, and frequently nausea, the creature experiences for hours after its wakening up. Horses

generally object more to the constraint imposed upon them than to the pain of such an operation as "firing," and we have seen that this constraint was necessary in order to give the chloroform. So that while the animal was being distressed by inhaling the vapour, the operation might have been accomplished, and the horse in its stall again, without suffering from the unpleasant effects of the anæsthetic. In none but very painful, difficult, and protracted operations is it advisable to use chloroform.

Veterinary surgeons have, to a large extent, employed the æther spray to produce local anæsthesia before operating on certain regions of the body; but so far as my experience goes, grave accidents are likely to attend or follow its employment in "firing." The operator's face has been singed, and the animal's limb has been enveloped in a blaze, while in one case the straw upon which the horse was lying caught fire owing to the inflammability of the vapour. In other instances the skin has sloughed deeply, and produced large sores, which took a long time to heal, caused much suffering, and left the animals badly blemished for life.

With regard to the frequency with which "firing" is resorted to, I fear that it is still too much in favour with certain people, and is employed when there is not the least necessity for it. Towards the end of last century it was a panacea for almost every disease and lameness of the limbs—real, or imaginary, past, present, or to come—and the burning iron was applied with no merciful hand by the untutored farrier, who, in the majority of cases, being ignorant of the seat of the malady, sometimes ploughed the skin from the top to the bottom of the limbs; for to fire deeply was the rule. Some of these men yet exist, and traces of their heavy hands and hard hearts are evidently on the legs of poor horses in many parts of the country.

The fashion of "firing" is dying out with the advent of a better knowledge of disease and its causes; and though it is still thought beneficial to score the legs of hunters after a hard season, or when they become shaky from hard work, yet I have no doubt this will also disappear when it is found that rest, with a milder and more rational treatment, will produce the same benefits. It is only among very old-fashioned people that the absurd fashion yet lingers of "firing" young horses' legs in anticipation of disease, or to prevent its occurrence. This is one of the foibles of the dark days of farriery, and is about as reasonable as applying a blister to the chest of a young child to prevent its having inflammation of the lungs when it becomes an adult.

This is not the place to speak of the cases in which "firing" is absolutely necessary; this must be left to the judgment of the properly-trained veterinary surgeon; but this much I may say, that instances have occurred in recent years—such as severe sprains of the back tendons, and disease of the hocks—in which, formerly, I would have employed the hot iron, but only used mild blisters, depending chiefly for recovery upon an absolute rest as possible. And I find my success is not a whit diminished by the change. I have made up my mind to use the cautery only as a *dernier ressort*, when serious disease is really present, and when everything else has been tried without avail.—*The Animal World.*

THE ETHICS OF HORSE MANAGEMENT.

In a country like our own, teeming with the finest and best horses in the world, and where every one fancies he knows much or all that pertains to horses and horsemanship, it is very disappointing, though by no means surprising, to find that even among those whose business or pleasure leads them into direct relations with that animal, there are some who appear never to have acquired the slightest knowledge of its temper, of its disposition, or of the way in which its strength and other invaluable qualities may be best utilised with comfort to itself and profit to its owner. We have daily evidence of this in our streets, and never have to travel far to seek for examples of some kind of mismanagement that not only mars the utility of the horse, and militates against its health and longevity, but, being contrary and irritating to its temper, either makes it irascible and vicious, or sulky and stubborn; and, consequently, either more or less dangerous or useless. This management, or rather mismanagement, is in very many instances due to ignorance and want of observation; for a man may be the whole of his life among horses, and ride or drive them like his neighbours, and yet know but little of that creature's disposition, or the best way to control it when it evinces something unusual in the way of ill-temper. But it may also be owing to a hasty or brutal manner, coupled, perhaps, with ignorance, and this, it is scarcely necessary to say, constitutes the worst and most unpardonable form of mismanagement. How often do we not see poor horses beaten merely because they are more intelli-

gent than those who beat them, and are chastised for doing that which they know is right, or refusing to do that which is wrong! Only a short time ago I saw a horse drawing a waggon, heavily laden with sacks of coal, up a steep street. The animal evidently know all the doors at which it should stop, or had beforetimes stopped, and consequently halted frequently; but it appeared that on this occasion there was no coal to deliver at any of these places, and at each check made by the mindful beast, it received a beating and savage tugging at the mouth, with the usual complement of harsh words, which made it look very stupid and sorry. And quite recently a light carriage was passing along one of our streets, but the horse drawing it appeared unwilling to go on, and tried to stop every now and then, which caused the driver to apply the whip very severely. "There goes a jibbing horse!" exclaimed a spectator. "Why don't you get out and see that the harness is all right!" says another; "don't you know that one of your traces is broken? If you don't your horse does, and yet you beat him for trying to tell you so." The intelligent but maltreated animal found that its trace was not all right, and, therefore, it thought proper to stop to have it rectified. This kind of mismanagement and mal-appreciation of the horse's intelligence is so common that one feels almost reluctant to allude to it, as it must be in the knowledge of every one who has paid any attention to the subject of rational horse government. We see horses beaten and punished because they do not chance to hear their driver's voice calling them to stop, and we note a violent use of the whip when they chance to manifest an intention to turn down some familiar street without an indication from the ill-tempered slave-driver. Some men—I fear many men—who have to do with horses think they were made to be beaten and abused, and that nothing can be done with them without a full quantum of punishment. I never visit town without coming home very much out of humour, and disgusted at the savage treatment to which I see horses subjected, especially in the Hansom cabs. The drivers of these vehicles, and particularly those which ply late in the evening, appear to take a kind of fiendish delight in scourging continually, and with a lash devoid of the slightest particle of tenderness, the poor, nigh worn-out animals, who have no redress for their terrible wrongs, and who, it may be said, die under the scourge. It may be said that these men have to earn a livelihood out of their calling, and that their horses must go; but if any one cares to observe he will soon perceive that there is no necessity for a thousandth part of the whipping or pulling

about these cab horses undergo, and that nearly all the punishment they receive is due either to bad driving, carelessness, bravado, drunkenness, or cruel disposition. These cabmen know nothing or care but little about their animals' sufferings, and, perhaps, neither they nor their masters are aware that bad treatment of this kind will wear out horses more quickly than hard work with gentleness. They have to learn the truth that humanity and interest go hand in hand, and that cruelty defeats its object. I never ride in a cab the driver of which abuses his horse; it is only encouraging him in his cruelty to to be a silent and patronising spectator.

There is another form of mismanagement which is occasionally seen—though, I believe, much less frequently than some years ago, when a common sense method of breaking-in horses was not so well understood, and when it was imagined that punishment and training by fear were the chief ingredients in the process—this is beating, spurring, and abusing animals which, from defective training by incompetent men, have become what are called "shyers," "jibbers," &c. It frequently, very frequently, happens, that horses addicted to the last-named habit are intelligent, high-couraged animals, which, perfectly docile at one time, have become through haste and passion on the part of those who havo driven them, sulky and obstinate. This is more especially the case with young horses; at first many of them are somewhat afraid of the collar, and if not gently and observantly treated, will take a positive dislike to it, which may assume the form of jibbing, and be most difficult to overcome. An ignorant, brutal fellow would, of course, adopt the cruel expedient of unmercifully beating such an animal to make it go; and to prove his utter inability to understand the creature's nature, or to manage it rationally, he may even go to work to punish it about the head, perhaps the most sensitive part of the horse's body, to cause it to go forward—a strange procedure, certainly. It is scarcely necessary to say that the brutal treatment resorted to in order to compel a jibbing horse to go forward has never yet been successful, and that no one deserving the title of "horseman" (I will not say "horsewoman,"—I am sure no woman would cruelly beat a horse) would venture to try it; for it is as unreasonable as it is pernicious. If patient persuasion and mild coercion do not succeed brutality never will. The horse, in all probability a highly sensitive and sensible animal, has become a jibber through cruelty or mismanagement, or inability to understand its requirements, and it is only by patience and gentleness that the impression the creature has acquired can

be removed. To inflict punishment is only to make the impression ineffaceable, and to attempt to conquer by brute force and brutal means what should be achieved by observation, reason, and humanity. High-couraged, sensitive, and intelligent horses, of all others, will bear least maltreatment, and will soonest offer a stubborn resistance; just as they are most docile and affectionate with gentleness. Examples of this are frequent, though, I believe, less so than formerly; and not unfrequently race-horses of courage, and steady, have to be ridden without whip or spur. "Mameluke," a well-known racer some years ago, and as docile a horse as was ever saddled, received a severe castigation when running for the St. Leger, and ever after proved uncertain, and even vicious. Many a race has been lost by the infliction of wanton cruelty.

A horseman should have tact, patience, the faculty of observation, a knowledge of the different dispositions of horses, but, above all, a kindly feeling for them. In taming by fear, it must be remembered that all the interest which the animal has is the avoiding of an evil; but in taming by gentleness, and caresses, and food, it is the attainment of enjoyment. The most extraordinary results have been obtained by gentleness and patience with almost every species of animal on which they have been persistently tried. Some years ago a young friend of mine, a good and humane horseman, when stationed at Malta, bought, for a very small sum, a barb that nobody on the island could manage, in consequence of its habit of stopping suddenly and refusing to go on, notwithstanding the most severe spurring and beating, which apparently made it only more determined to have its own way. He was much laughed at for his foolish purchase, and on the following day, being resolved to discover what could be done with it, he had it saddled and led round to his quarters. Some of his brother officers got their horses ready and accompanied him, anticipating, I have no doubt, some amusement. They had not proceeded far until, in a narrow street, the animal came to a stand-still, and would not follow its fellows. Instead of beating it, my friend told his companions to leave him and he would follow in time; then, quietly composing himself in the saddle, he lit a cigar and began to smoke, as if he were in his room in an easy chair. This was about mid-day, and towards the afternoon, having started without luncheon, he obtained some refreshment from a neighbouring shop; the horse, astonished, I dare say, at the absence of its usual dose of punishmant, soon became uneasy, and wished to go on; but it was immediately

checked, and compelled to remain, until, at last, towards the evening, the tightened rein was slackened, the barb gladly rushed forward, its rider took it at a canter through several streets and then home, perfectly cured of its habit,—indeed, whenever it came into the street of its humiliation, instead of stopping it had a greater tendency to run away.

Some years ago, a horse in the depôt at Woolwich had proved so unmanageable to the rough-riders, that at length no one among them dared to mount it, as it lay down and rolled over its rider, or crushed him against the wall or anything near. All the means in vogue in those days were unavailing to correct it of these dangerous practices; so it was at length brought before the commanding officer, with the character of being "incurably vicious," and with a recommendation, on that account, that it should be "cast," and sold out of the service. A colonel Quest hearing of this, and knowing the horse to be well-bred, and one of the best actioned and cleverest horses in the regiment, besought the commanding officer to permit it to be transferred into the riding troop. This was agreed to, and the transfer was no sooner accomplished than the colonel determined to pursue a system of management directly opposed to that which had been already attempted. He had the horse led daily into the riding-school; suffered no whip ever to be shown to it while there, but patted it, and tried to make it execute this and that little manœuvre; and as often as it proved obedient, rewarded it with a handful of corn or beans, or a piece of bread, with which bribes his pockets were invariably well supplied. In this manner, and not before, the rebellious horse was not only subdued and tamed, but rendered so perfectly quiet that a little child could ride it. In fact, it was at length taught to kneel while its rider mounted, and to perform various evolutions and tricks which no other horse in the school could be brought to do; and so great a favorite did it become that its master gave it the appellation of "The Darling." What different treatment this to beating it on the head and shins, and what a different result!

The celebrated cattle breeder, Bakewell, at an advanced period of life, not only conquered a vicious restive horse, but, without the assistance of either grooms or jockeys, taught this animal to obey his verbal orders with as great attention as the most accomplished animal that was ever educated at Astley's school. Bakewell was accustomed to say that his horse could do everything but speak. The method which he adopted to conquer this vicious animal was never told, even to his own domestics, which was a great pity. He ordered

his own saddle and bridle to be put on this horse, which at that time was thought to be ungovernable; and that no one might be witness to the contest, he led the horse till he was beyond the reach of observation. How far he walked, or in what manner this great business was accomplished, was never known; but when he returned from his journey, the horse was as gentle as a lamb, and would obey its master's verbal orders on all occasions. When what are called irrational animals are taught such strict obedience to the command of a superior order, it is in general supposed to be the effect of fear; but Bakewell never made use of either whip or spur. When on horseback he had a strong walking-stick in his hand, which he made most use of when on foot, away from horses; he always rode with a slack rein, which he frequently let lie upon the horse's neck, and so great was his objection to spurs that he never wore them. It was his opinion that all such animals might be conquered by gentle means; and such was his knowledge of animal nature that he seldom failed in his opinion, whether his attention had been directed to the body or the mind.

Instances innumerable might be given, even from personal experience, in which kindness has conquered when cruelty only made obstinacy and viciousness more incredible; and so fully is this recognised now-a-days in training army horses, that it is indeed rare to see or hear of a vicious trooper; while a soldier discovered beating or bullying his horse is severely punished. This more reasonable and humane management is a positive saving to the country, as the horses last longer and there are much fewer accidents. So well is it understood that kindness will govern horses, and pain and bullying sour them, that as soon as an animal shows symptoms of restiveness, inquiry is immediately made into the character of its rider; as if the old maxim might be translated into "Tell me the temper of a trooper's horse and I will tell yon the character of the soldier."

No men deserve the title of "horsemen" who beat horses; it is not the way to manage them, and it will always be found that those who do so are either ignorant, stupid men, or possessed of a cruel disposition. Such individuals should have nothing to do with horses.

In concluding my remarks on this important subject, I am reminded of the eloquent and noble words of Lord Erskine in his speech on the second reading of the bill for preventing malicious and wanton cruelty to animals:—"We are," he said, "too apt to consider animals under the dominion of man in no view but that of property, whereas the dominion

granted to us over the animal world is not conceded to us absolutely. It is a dominion in trust; and we should never forget that the animal over which we exercise our power has all the organs which render it susceptible of pleasure and pain. It sees, it hears, it smells, it tastes. It feels with acuteness. How mercifully, then, ought we to exercise the dominion entrusted to our care!"

G. FLEMING, Royal Engineers.

—*The Animal World.*

ON THE SO-CALLED "NERVE" OF THE TOOTH.

By T. C. WHITE, Hon. Sec. to the Quekett Microscopical Club.

THERE is no field of microscopical investigation more pregnant with interest than that which comprises the study of the histological characters of the various elements that help to make up the sum of the animal frame. I would not in saying this seem to deprecate those other subjects in which lovers of microscopy find such delight. Micro-zoology, the physiology and structural elements of the vegetable world, and those studies having for their object the development and correction of the higher powers of our microscopes, possess their several interests, and are very important as fields of research; but I believe they will be found to pale before that study which enables us to arrive at a knowledge of those structures which build up and bind together the various organs of the human frame. A vast amount of work has yet to be done in comparing these several tissues with those of the lower animals, both as regards their embryonic condition as well as that of adult life; but it is not of comparative histology, nor of histology in its general aspect, that I would speak to-night, so much as of one particular tissue for which all present have, doubtless, at one time or another, felt a peculiar interest—I mean what is called the "*nerve*" of a tooth. Great uncertainty exists in the popular mind relative to its exact locality and nature; all know it to be a very painful subject, not to be touched upon except very lightly, and many desire to see what it is like. Now it occurred to me that it might not be altogether an uninteresting subject to bring under your notice, and while we were enabled to see what structural elements even so small a portion as this might afford for our powers of observation, it might at the same time stimulate the members of our Club generally to work out systematically the histology of the other structures

of the animal frame. These fields have been well worked by others, it is true, but we reap the harvest of their labours in the many manuals on the subject with which our scientific libraries abound; but though skilful gleaners in the field of scientific investigation leave little for us to gather, yet stray facts may still be picked up by diligent and careful, but above all, *systematic* observers.

I trust that you will deal leniently with me if I presume for a moment that you know nothing whatever of the various structures entering into the formation of a tooth. I can thus, in an elementary manner, recall to your minds the osseous elements we meet with in our examination. If a tooth be divided lougitudinally the main body of such a section would reveal three different substances surrounding a cavity which, to a certain extent, partakes of the external shape of the tooth; immediately surrounding the cavity, and constituting the principal bulk of the tooth, we notice a fibrous silky substance, called the "*dentine*;" capping that part of the dentine which appears above the gum, we see the crystalline, almost insensible "*enamel*," designed to protect the highly organized and exceedingly sensitive dentine beneath it; we shall also observe that the dentine inserted in the jaw, and forming the root of the tooth, is clothed with a material of a different appearance to the other two substances—that is called the "*cementum*." Of the enamel and cementum, it is not necessary on this occasion to speak, but the important relation existing between the "nerve" and the dentine demands that I should enter more into detail in explaining its microscopical appearance. In looking at a section of dentine under the microscope in a well-developed human tooth, one is reminded of those views of the comparative sizes of the rivers of the world given in some atlases, only here our rivers are all the same diameter and about the same length, and run together in parallel waves. If, for the sake of illustration, we speak of them as rivers, we should say that they arise beneath the enamel by exceedingly fine tributaries, by the confluence of which the main stream is gradually enlarged till, flowing on towards the centre of the tooth, its "*debouchure*" helps to make up the walls of the central cavity, which is occupied in the living state by the so-called "nerve." A closer examination of our metaphorical rivers with higher magnifying powers will show us that they are tapering and undulating tubes, and existing so abundantly in the dentine as to impart to it that fibrous silky aspect which cannot fail to strike the most casual observer. These tubes, which, on the walls of the cavity, measure about $\frac{1}{10000}$th of an inch in diameter, are

occupied in a recent tooth by transparent structureless fibres known as the dentinal fibrillæ, the exact office of which is but obscurely defined, but they may minister to the nutrition and vitality of the tooth, since, when from age or disease these tubes become consolidated, the fibrous structure is replaced by one resembling horn, and, as a consequence, the tooth dies, becomes loose and a source of painful irritation. If a section of the dentine be made in a direction that shall cut across the course of these tubes, each tube will present an irregular aperture, and will be seen separated from its fellows by an almost equal proportion of intertubular tissue. We need not now consider any further the character of the dentine, as I shall have to recur to it when speaking of its relation to the nerve; but what I have laid before you will enable you to understand the meaning of much of the structure it is our especial object to examine in the central or *pulp cavity* of a tooth.

If we take a recently extracted healthy tooth and split it we shall notice that the pulp cavity is occupied by a pinkish fleshy mass about $\frac{3}{4}$ of an inch long and $\frac{1}{10}$th of an inch wide at its upper and thickest part; it partakes somewhat of the external shape of the tooth, being wide in the upper part, and tapering towards the tooth: this, then, is what is popularly called the "nerve." In physiological parlance it is termed the pulp. The basis of this pulp is composed of areolar tissue, whose interstices are filled with a homogeneous plasma.

A microscopical examination of its exterior will reveal an infinite number of small points, giving to it an appearance not much unlike the cross section of the tubes of the dentine, both as regards size and distribution. Having noticed this much, recourse must be had to compression before we can readily make out the arrangements of its internal structure. Before proceeding to flatten it by pressure it may be withdrawn from its cavity, and allowed to soak in the ammoniacal solution of carmine, recommended by our President in his book 'How to Work with the Microscope;' let it remain in it twenty-four hours, wash away the carmine fluid, and transfer it to glycerine for a few hours; then put it under gentle, gradual pressure for some few hours more, when it will be rendered sufficiently thin to be easily examined by a $\frac{1}{4}$ of an inch objective or higher powers.

Commencing our examination at that part of the pulp nearest the apex of the root, we shall notice it entering the foramen of the fang as a fine thread, which though so fine nevertheless conveys the nerve and the artery into the pulp,

and gives exit to the returning vein; tracing this thread into the pulp we shall readily distinguish the nerve as a bundle of parallel fibres, which, running in together a short distance, divide into two, three, or four fasciculi, and dividing again still give off fibres to every part of the pulp; it is highly probable that these fibres end in loops, but the pressure necessary to reduce the pulp sufficiently thin for observation ruptures the loops, and consequently they very frequently appear to terminate in free extremities; but one fact may be easily demonstrated, namely, their course is always at right angles with the dentinal tubuli. Besides the ramifications of the dental nerve the pulp also contains the branches of the artery and its vein; these are not so easily followed, but in an examination of the pulp of a tooth extracted for severe inflammation in it, the congested vessels were naturally injected, and could be seen as a complicated network without any definite arrangement excepting a loop-like distribution towards the circumference; in some cases the vessels of the pulp, becoming stained by the carmine, will be readily seen with their peculiar transverse nuclei and distinguishable from the areolar tissue, whose nuclei are spindle-shaped. There is one feature in the microscopical examination of this prepared pulp which will not escape observation—it is the curious arrangement of its cortical portion. In referring to the microscopical appearance of the exterior of the pulp, as it appears on first splitting a tooth, I alluded to the comparative likeness presented by it to that of the dentine cut across the tubes, and if that comparison is borne in mind in the examination of this external portion of the pulp, under its present circumstances, we may easily interpret the meaning of this arrangement. The cortical substance of the pulp in its healthy condition consists of a number of oval bodies placed side by side with their long axes perpendicular to the surface of the pulp on which they stand; they are deeply stained by the carmine, which proves that they are endowed with active and growing powers. These oval bodies are termed "*Odontoblasts.*" An examination of an odontoblast, which has been isolated by pressure from the others, will show that it has an attachment by a transparent structureless appendage to something within the body of the pulp, while a similar appendage, proceeding from its distal extremity, penetrates a tubule in the dentine, and becomes the dentinal fibril of Tomes.

The odontoblastic layer of the pulp is so important an element in the life and histology of a tooth that its history deserves a closer examination than the limits of a paper like

this can afford; but it may be interesting to show the part it plays in the formation of the dentine.

About the sixth or seventh week of embryonic life a groove is formed in either jaw, at the bottom of which, after the lapse of a few weeks, papillæ begin to arise, and shortly after transverse partitions in this groove shut off and separate each papilla, which then becomes the representative of the future temporary tooth. About the seventh month of fœtal life the ossification of the tooth commences, and the dentine is represented by a cup-shaped scale capping the crown, and ultimately extending down the sides and embracing the whole of the upper surface of the pulp. It is at this period of their growth that the odontoblasts are most active, for they have the development of the dentine before them, and deriving a plentiful supply of nutrition from the plexus of blood-vessels beneath them, dentine is formed through their agency from without inwards, till the pulp being reduced to the size at which we generally see it by the gradual formation of the dentine, the odontoblasts become dormant, but capable of awaking to activity under the influence of certain circumstances of irritation; thus if caries attacks a tooth at a particular spot the tubuli in the dentine, through the fibrillæ in them, become consolidated at an equal distance from the point of attack all round it, and a barrier seems to be thus thrown up against the inroads of the advancing enemy; but unless such a remedial measure as the careful excavation of the carious portion of the tooth and subsequent plugging of the cavity be adopted, barrier after barrier may be thrown up but to be overcome. Even then the odontoblasts of the pulp resist by forming new dentine in its very substance, and it is only when inflammation and suppuration destroy the odontoblasts that this reparative process is annihilated. In some cases of general irritation of the pulp, as where the crown of a tooth is worn through by the grinding down and wear of mastication, the whole of the pulp may be converted into an irregular dentine. Sometimes nodules of ossific matter are found in the meshes of the areolar tissue of the pulp, but these do not partake of the character of the dentine, but are semi-transparent and structureless, testifying to the amount of bone-producing matter in the homogeneous plasma saturating the body of the pulp, but which it is the legitimate office of the odontoblasts to build up as dentine.

There are great and, I fear, almost insuperable difficulties in the way of clearly seeing the termination of the nerve fibres in the pulp; one can only conjecture at the method in which they end. In some specimens two fibres may be seen run-

ning side by side for some distance, and when you expect to see a loop the ends are found separated; this may probably arise by the pressure used to render the pulp thin enough for observation. Some specimens, again, show a very apparent looping of the fibres, but the loops extend round the circumference towards the end of the pulp, they are so large; but in no case have I met with fibres that would lead us to suppose that were they small enough to enter the tubuli that they do so. How, then, are we to account for the painful sensation experienced in cutting into live dentine, unless we suppose that a connection of some kind exists between the tubuli and the fibres of the nerve? The only theory that can be suggested is that the dentinal fibre contained in a tube of the dentine passes out through its odontoblast, and then, becoming fused with the nerve, conveys the sensation to the brain, and we are conscious of the irritation.

I have not found it possible to see this connection between the odontoblast and the nerve fibres, because the reagents usually employed to render nerves visible, dissolve away the odontoblasts; neither have I, by means of thin sections, been more fortunate, as the proximal caudal appendage of the odontoblast is too transparent and too minute to admit of demonstration, except, perhaps, by the employment of new reagents; in specimens of the pulp, that after staining with carmine have been teased out with needles, the isolated fibres have had, besides their own coloured nuclei, coloured odontoblasts, with this internal caudal appendage fused into their outer parts. Such may be the general mode of their connection, but I am not clear on that point. Such, then, are a few of the principal elements met with in a microscopical examination of what is popularly termed the "*nerve*" of a tooth, but in case any member present may feel inclined to work out these details for himself, it may be as well to append a few remarks relative to the plans of investigation, attended by the best results. The teeth employed have been temporary teeth, removed in a healthy condition, to make room for the advancing permanent set, any others being unsuitable from disease. It is necessary to exercise great care in extracting the pulp from them, as the bone dust from the tooth and impurities of various kinds cling most tenaciously to the odontoblasts, and not only obscure the view of the delicate details, but look unpleasant and slovenly. The plan found to answer best is to file a longitudinal groove round the tooth; then, having washed away all the *débris* very thoroughly, split the tooth with a pair of wire nippers, when it will come clearly in two and expose the pulp for its whole

length, when it may be withdrawn by seizing it at its smallest part and tearing it out of the cavity. This will draw out not only the odontoblasts but some of the dentinal fibres attached to them. Another very good plan for observing the relation of the pulp to the dentine is to soak the tooth for a few weeks in the carmine-staining fluid, which becomes sucked up through the foramen of the fang, and being absorbed by the pulp, colours it completely. The tooth may then be decalcified by immersion in ordinary hydrochloric acid, which removes the lime but does not hurt the soft tissues. At the end of a fortnight the tooth may be cut in thin slices, when the pulp will be cut with the decalcified osseous tissue, and the relation will be well shown. I have thus, in these few brief remarks, which fail to do justice to my subject, endeavoured to show you that that which is generally called the nerve of a tooth is in reality a mass of areolar or connective tissue, through which ramify the nerve, vein, and artery destined for the life of a tooth, that its function originally was the formation and building up of the dentine, that its powers in adult life remain dormant, but capable of being aroused under the action of a stimulating influence to develope dentine again, and that it performs an important part in ministering to the vitality of a tooth, as well as constituting a tooth a very delicate sensory organ. These few remarks, therefore, will, I hope, have the effect of inducing others to take up the comparative histology of the pulp, and lead them to investigate its tissues in some of the lower animals, both in their fœtal condition and at maturity, and I can promise them a rich reward in return for their labours in new fields of observation open, and fresh revelations of the skill of the Great Architect of All.

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

THE GENERAL PHYSIOLOGY OF VIRUS AND OF VIRULENT MALADIES.

By M. A. Chauveau, Professor at the Lyons Veterinary School.

(The havoc and alarm caused by contagious diseases in man and the lower animals is now more than ever attracting

the attention of the general public, and stimulating the observing faculties and patient investigations of medical philosophers.

With the increase of human beings and domesticated animals, it would appear that life and utility are yearly becoming more valuable in the advancement of mankind; while the prevalence and destructiveness of virulent maladies seem to out-pace this progressive increase of life, and to retard considerably the development of that state of well-being and happiness which should distinguish every stage towards the highest degree of culture and civilisation.

Science, it must be confessed, with its manifold and ever increasing means of research, has as yet not made such rapid strides in elucidating the mysteries that surround the genesis, maintenance, and propagation of these diseases, as the aspirations of humanity would desire; but it must be remembered that these mysteries are very profound—as profound almost as that of life itself—and that until quite recently the paths that should have been pursued were either ignored or unknown. Medicine started on the wrong track when it devoted itself wholly and solely to the cure of disease, instead of grappling with the problem of how to prevent it by seeking out the influences upon which its advent and maintenance depend. This grave error has been remedied; and the devotion and energy that was until lately devoted to the study of symptoms and the methods of relieving them are now turned towards the elucidation of causes, and the means of counteracting or abolishing these.

Foremost in this right direction is the distinguished anatomist and physiologist of the Lyon's veterinary school—M. Chauveau, and his success in investigating the character of virus, and the intimate nature of virulent affections in man and the lower animals, has already procured him a world-wide renown, and exalted his reputation as a medical philosopher to the highest degree. Every step he has made towards the solution of some of the most subtle questions connected with the poisons that produce these diseases is pregnant with the deepest interest, as it has been of the highest moment to mankind. The results of many years' researches, and the summary of several voluminous reports, have lately been given in a series of conferences and lectures before the Society of Medical Sciences of Lyons. A translation of these, from their high scientific character, the immense importance which attaches to them, the strictly logical basis upon which the results are founded, and the fact that they embody the achievements of one of the most distinguished

and talented members of the veterinary profession, in a line of research which particularly pertains to comparative physiology and pathology, cannot but be acceptable to the readers of the *Veterinarian*. An analysis of these lectures and conferences would neither do justice to the subject, to their high merits, nor yet to their eminent author; I shall therefore offer no apology for giving them *in extenso*, feeling assured that in doing so, I shall have the approval of those for whom the translation is made.)

THE INTIMATE CAUSE OF VIRULENCY.

Gentlemen,—I purpose to commence this year a series of conferences on the virulent maladies which have been the special object of my studies in comparative pathology and experimental medicine. The plan I propose to lay before you consists in initiating you, in furnishing the monograph of a small number of given maladies, to the conquests which the intervention of the experimental method has permitted science to make on the subject. I do not see my way at present to the possibility of uniting, in a complete synthesis, the disjointed elements of this analytical study, in order to transform it into a general theory concerning virus and virulence. However, to-day I stand before you, to address you about virulent maladies considered in a general manner. Why am I not faithful to my first intention? Have I then modified my views as to the opportunity of establishing a tentative systematisation of the physiology of viruses? Certainly not. Even to-day I regard this tentative as premature. To determine me to pursue this course, even with that excessive prudence and reserve which you will see me exercise at each step that I shall take, it was necessary that powerful considerations should exercise the most energetic pressure on my resolutions.

What are these considerations? They are of two kinds. The one order has only the weight which attaches to particular interests. The other, much more important, belongs to the general interest of science. I will crave your permission to say a few words on both of these points. It is now many years since I commenced my researches with the view of throwing light on the nature and mode of action of virus. Although a small number only have been published, the public has always been kept *au courant* with these investigations. For my two laboratories—that which is at my own house, as well as that which is at the Veterinary School—

have always been open to all those who have wished to follow me in my labours. That is to say, that all those who have wished it have been able to acquaint themselves not only with the results obtained, but also with those results which are as yet sought for; as well as with the various means employed in these researches, and the ideas which instigated the experiments, in accord with the general direction in which my study of these poisons tended with regard to its logical and technical bearings. I am in the habit of working in broad daylight in the midst of those who surround me. I do nothing mysteriously; I love science sufficiently well not to be unmindful of its progress, and to labour to perfect it, advancing it without troubling myself to disguise the part I take in doing so. And, in addition, a goodly number of the ideas originating in my laboratory have had a commencement of popularity beyond all publicity, properly speaking. The small circle of friends and fellow-workers which surround and assist me, has thought that I ought not, in the actual circumstances, to allow the public to think that these ideas had originated from other than their true source. These ideas belong to Lyons. They are part of her scientific patrimony, and in their way, however trifling they may be, they will add to the claims which our city has a right to make on the attention of those upon whom falls the task of reorganising scientific instruction in France. To lay claim to this right is, therefore, in some measure a civic duty, and one from which it was difficult for me to refrain. Nevertheless, these considerations, as cherished as the interests which provoke them, would not have been able to determine me to undertake the trial of systematisation that I am going to make before you, if they had not been based on motives of scientific interest, concerning which I shall presently bring to your notice.

If it is certain that the physiological study of virulent maladies is as yet too little advanced for the building up of a theory on virus, based on an experimental demonstration complete in all respects, it is no less certain that science already possesses many facts which have brought this demonstration to a high degree of advancement. Numerous results are being achieved every day in this field of investigation, which are sufficiently important and significant to permit, even at present, of pronouncing a judgment on the diverse tendencies of opinion on the theory of viruses. I believe, then, that it is now indispensable to pronounce this judgment. This will be an indication for those workers who devote themselves to these studies, and whose efforts

threaten to become abortive by reason of their being exercised in a wrong direction. Indeed, there is no concealing the fact, that the scientific public is leading itself astray in its attempts to discover the nature of viruses and of virulence. It has received with the same amount of enthusiasm, facts differing very widely in their force and signification. Its critical spirit is not exercised with sufficient vigour and severity on the demonstrations which have been presented to it. The result has been much confusion. If the attempt which I make to-day dispels this confusion, my labour will not be altogether lost. If it succeeds in completely rectifying the errors of those engaged in the study of virulent maladies, it will, I think, have rendered a real service to science. This thought has incited me. The experience, dearly and laboriously acquired, that I am able to place at their service, authorises me in believing that my intervention will not be altogether futile. To work, then; the moment's propitious! The whole world now understands the importance of researches in comparative pathology and experimental medicine. There is not, in the vast domain of biology, ground better prepared for receiving the culture of the experimental method. The most fruitful of all is, indubitably, that of virulent maladies. It is an inexhaustible mine. What investigations to undertake! What problems to solve! What practical applications to make! What precious results to obtain for the welfare of humanity! We already press on, fired with ambition, in the road which leads to the most useful conquest of modern science. When our teaching institutions are reformed; when experimental medicine and comparative pathology shall enjoy the means of study worthy of the services which they have already rendered and which they are called to render, the multitude will enlist itself with more ardour on the side of the study of viruses.

To prepare the soil for this study; to demonstrate what still remains to be done, by showing that which has been acquired, is then a work of the highest scientific utility. This is why I have overcome my repugnance for an enterprise which cannot in any way pretend to a complete success, and concerning which the issue will remain, on certain points, plunged more or less profoundly in the clouds of uncertainty.

It is well, otherwise, that in seeing the experimental method applied to the theory of viruses, you should learn that the problems to be resolved are not yet disengaged from all their mysteries, notwithstanding the numerous and laborious efforts which have been made for their solution. You

will have none the less esteem and respect for the results acquired, and you will certainly be moved by the desire to contribute towards their increase. Though a definite, precise, and absolute conclusion may not be our aim, our discussion will be none the less interesting. A particular attraction belongs to those subjects which do not manifest all their aspects equally, and which are yet open to efforts made by science to thoroughly master them. You will be more interested in assisting at the exhibition of these efforts, than if you had no more to do than to register the result. When nothing remains to hide the truth, the questions are resolved. But a question answered is only a battle gained, the tidings of which will be proclaimed hereafter. A question being resolved is a battle in which we assist, and whose fortunes we follow; it is a struggle in which the mind of the spectator—I mean he who listens—may take the same part as the mind of the actor—he, I mean, who speaks. And the interest that this struggle inspires, the passion that animates it, are otherwise as grand and noble as the savage and sanguinary emotions of the battle field. Is it not, in fact, a contention for the welfare, for the existence even, of humanity?

And then, lastly, we do not interdict ourselves, in venturing to-day on the necessarily incomplete sketch that we are about to undertake, to return at a later period to our first idea. When this general outline is terminated, we shall place on more solid and better known ground, certain particular facts. I speak of tuberculosis, glanders, variola, vaccinia, &c. And, if time and strength permit us at a later period to utilise the results obtained in this study of each virulent malady considered in a particular manner, so that we may again refer to the theory of virulency, our present tentative will not have been useless; but will have proved a valuable preparation Let us launch, then, with this hope, into our thorny enterprise.

THE DOMAIN OF VIRULENT MALADIES.

At the very outset we will enter into the list with one of those thousand obstacles that we are called upon to encounter in this premature research on the theory of virulence. What is a virulent malady? What kind of maladies are they which deserve this name? Here, then, are two points on which it is important to be understood before commencing our study. It is necessary that the subject of the study should be well defined. If, by a definition too exact and an enumeration much too extensive, we enter in the list of virulent maladies

which does not possess the veritable attributes, we expose ourselves to the danger of falsifying the general theory that we wish to establish. To avert this serious inconvenience should be our first care; and to do so we will even risk the danger of falling into the inconvenient opposite: that is to say, we will erase from our outline, perhaps, maladies that are really virulent. This is altogether indifferent so far as the value of our systematisation is concerned. If the latter is established from the analytical documents exclusively furnished by the truly virulent maladies; if a rigorous logic has presided at the joining together and at the generalisation of the facts which have to be harmonised, and has united them in a homogeneous theory, this will remain intact when we shall at a later period be able to bring in new facts pertaining to maladies provisionally excluded from the domain of virulency. What ought we then to understand by a virulent malady? If it sufficed to answer this by giving examples, we would say smallpox, cowpox, glanders, syphilis, rabies, &c. No one would then contradict us, and we could be understood by every one. Yes, the maladies we have just mentioned are very virulent. But it is necessary to say why; it is necessary to give them a short and substantial definition—a definition which will neither tend to confuse nor be equivocal. But you will see that this definition cannot be formulated without introducing an element which will appear to you a gross begging of principles. In grounding the definition of virulent maladies on their fundamental character, that is to say, their transmissibility, one cannot define them otherwise than contagious maladies considered in a general manner. But all the contagious maladies are not virulent.

The contagious diseases form a family, and the virulent maladies a genus in this family. It then becomes necessary to add to the definition of the latter a special character which, joined to the general character of transmissibility, enables us to distinguish this from the others, *i. e.* contagious diseases. But the only distinctive character that I can give you is hotly contested even now, and the proof of its reality constitutes precisely one of the principal objects of the study we are now undertaking.

A few illustrations will make you better comprehend the difficulty which we are called upon to confront. It is not very long since the question which we are now examining appeared quite clear to every one. There were designated by the general name of "contagious diseases" all the maladies capable of transmission from sick to healthy people; and according as the transmission had for an agent a *parasite* or a

virus, they called the one *parasitical diseases* and the other *virulent diseases*. But even to-day we aim at assimilating these parasitical beings to the viruses themselves; those agents up to this time so mysterious that people are even ignorant of the physical state in which they exist in nature. Between the acarus, the cause of mange, and the element to which is due the development of blennorrhagia; between the little nematode worm which engenders trichinosis, and the principle whose action on the organism produces typhoid fever in the healthy subject, there would be no fundamental difference. Thus, there should no longer be any distinction between contagious maladies. All would be parasitic. The active agents, the cause of virulent maladies, would reappear in the category of proto-organisms, which Pasteur has proved to be the essential agent in the principal fermentations. These maladies, in their various anatomical and physiological manifestations, would only be the expression of the development of these minute beings. I will presently prove to you, that with the general character that it affects, this tendency of opinion is altogether erroneous, and during these conferences I will frequently have occasion to revert to this proof.

For the present, you must content yourselves with my assertions. I acknowledge that phenomena analogous altogether, or even identical, to putrid fermentation, can manifest themselves in the living organism under the influence of the development of certain vibrionæ.

On the contagious character of the affections that result from this development, I have not the slightest doubt whatever. But I refuse them, very categorically, the virulent faculty. They do not form part of our domain. The general theory of virus that we seek to establish will not apply to these affections. We will, therefore, strike out all the elements of study which they might furnish from the considerations by whose aid we seek to establish the bases on which we wish to rest this theory. This is why we will not speak of anthracoid diseases. It is necessary to wait until more complete researches have taught us more exactly than we now know, the distinctions to make between anthrax with bacteriæ and anthrax without them.

(*To be continued.*)

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING, APRIL 3RD, 1872.

The President, B. CARTLEDGE, Esq., in the Chair.

Present—Professor Simonds, Professor Brown, Professor Pritchard, Mr. Lowe, Mr. Withers, Mr. Silvester, Mr. Cowie, Mr. J. C. Broad, Mr. R. Pritchard, Mr. Naylor, Mr. Gowing, Mr. Broad, Mr. Owles, Mr. Harpley, Mr. Cartwright, Mr. Greaves, Mr. Moon, Mr. Burrell, Mr. Field, Mr. Coates.

The President.—I think our first duty should be to give expression to the regret we feel at the loss which the profession has sustained by the death of Mr. Robinson, who has been so long and intimately associated with us, and whose cheery face we shall all so much miss. I believe he has no relations to whom a letter of condolence might be sent, otherwise I should have had great pleasure in proposing that we send such a letter. I think, however, an expression of regret at the loss we have sustained should be placed on the minutes.

Appointment of an Examiner.

Mr. R. Pritchard expressed his opinion that the appointment of an examiner to fill the vacancy occasioned by the death of Mr. Robinson should be postponed till after the forthcoming examinations. The election of a member of the examining Board was a very responsible duty, and required great consideration; the Council ought not, therefore, hurriedly to fill up the vacancy by the appointment of any person however well fitted for the position they might think him. A great deal of complaint had been made against the cattle table, and he trusted that the Council would take care to appoint a most efficient man, whose name would do credit to the diploma he signed. He, therefore, suggested that the election should be postponed in order that they might have further time to consider the matter, and thus be able to select the best man for the position.

Mr. Harpley said he saw no reason why the appointment should be delayed, and he, therefore, proposed the appointment of Mr. Hunt, of Birmingham.

Mr. J. C. Broad seconded the motion.

Mr. R. Pritchard proposed as an amendment that the appointment be postponed till after the present examination.

Mr. Gowing seconded the amendment. It was essentially

necessary that the examiner appointed should be not only a scientific but a practical man.

The amendment was negatived, and on a ballot being taken Mr. Hunt was elected.

Professor Simonds said he had abstained from voting for several reasons. He knew quite enough of Mr. Hunt to feel convinced that he would make a very efficient examiner, for he had had for many years as much to do with him professionally as perhaps all the members of the Council put together; but standing in the position he did at the present time, he felt it would have been inconsistent for him to take any part in the election of an examiner of those pupils which he had to instruct.

Mr. Hunt, in thanking the Council for his appointment, said it might have occurred to some that as he was a town practitioner he was not quite so suited to the cattle table as one whose occupation was more in the country, but he believed he had as large a cattle practice as most men, and his association with agricultural societies had given him a more intimate knowledge of the diseases of cattle than he otherwise could have acquired. He quite agreed with Mr. Gowing that it is also essentially necessary that the examiners should be both scientific and practical men. He hoped that he had not been away from college so long as not to retain some of his scientific acquirements. He accepted the appointment with greater pleasure than if it had been to any other table. He thanked the Council for his election, feeling in his own heart that he should be able to do his duty at the table to which they had appointed him.

The following letters were then read:

(1) From Mr. Balls, of Brixton, expressing his regret at being unable to attend the meeting.

(2) From Mr. Fleming, to a like effect, and presenting to the Library a copy of his work entitled 'Practical Horse Shoeing.'

On the motion of *Professor Brown,* seconded by *Mr. Gowing,* a vote of thanks was accorded to Mr. Fleming.

(3) From Mrs. Spooner, acknowledging a letter of condolence from the President and Council.

On the motion of *Professor Pritchard,* seconded by *Mr. Lowe,* the letter was directed to be entered on the minutes.

(4) From the President to the Secretary, approving of his suggestion to send a copy of Bye-law 33 as amended, to the principals of the various colleges and to Dr. Dunsmure, Secretary to Scotch section of the Court of Examiners.

(5) From P. W. Hayden, acknowledging the receipt of his certificate in lieu of his lost diploma.

(6) From Colonel Fitzwygram, of Mhow, India, enclosing his examination fee.

(7) From Mr. G. Bodington, of Cardiff, asking a question with regard to the apprenticeship clause, and the terms on which candidates were admitted to examination. He had been informed in reply that there was no apprenticeship clause in the bye-laws of the College, and that all candidates were required to bring certificates from the principals of the colleges that they had attended.

(8) From Professor Simonds, enclosing a letter from Mr. N. Vasey, of Illinois (who holds the Highland and Agricultural Society's certificate), asking for information with regard to a written examination, and naming the mayor of the city to take charge of his examination papers. He had been written to in reply, and desired to forward the name and address of the magistrate, together with his examination fee before any further steps were taken.

(9) From Mr. John Simpson, of South Carolina, requesting to be furnished with a duplicate copy of his diploma, bearing date April 22nd, 1864, which he alleged had been destroyed by fire. He enclosed three letters in proof of his statement.

The Secretary was directed to reply that the Council did not regard the proofs of the destruction of his diploma as satisfactory.

(10) From Mr. W. Weeding, asking to be furnished with a synopsis of examinations. He had been informed that canditates were required to produce certificates of attendance at one of the recognised schools.

(11) From Dr. Taylor.

(12) From Dr. Sharpey.

(13) From Professor Ellis.

These letters were to the same effect, viz. that April 15th would be a suitable day on which to commence the examination of candidates from the Royal Veterinary College.

Professor Simonds said, in all probability there would be sufficient pupils to occupy the Court of Examiners six nights. The preliminary examinations were at present going on. There were between seventy and eighty names down on the list, and it was fair to infer that six nights would be required.

The Council resolved to fix April 15th as the date on which the examinations should commence.

(14) Letters from Professor Williams, Professor M'Call, and Dr. Dunsmure.

From these letters it appears that there are thirty students for examination in Edinburgh, and from fifteen to eighteen in Glasgow. It was proposed that the examinations should commence in Glasgow on the 16th April, and in Edinburgh on the 17th. The letter from Dr. Dunsmure also suggested that the examinations in Glasgow might be finished in one day, and that six professional examiners should be employed for the practical examinations. If the Council decided otherwise he wished them to appoint the four who should examine.

After some considerable discussion, during which Mr. Greaves stated that when the examinations at Glasgow were originally fixed, Professor M'Call had distinctly proposed that the students in excess of twelve at Glasgow should be brought to Edinburgh rather than the examiners should be detained another day in Glasgow; it was agreed to leave the Scotch section of the Court of Examiners to arrange the details of the forthcoming examinations.

Professor Brown proposed that a sum of thirty-six guineas be voted as fees to the examiners for the practical examinations for 1872.

Mr. Gowing seconded the motion, which was agreed to.

Mr. Gowing proposed, and *Mr. Broad* seconded, "That a notice be sent to all the veterinary examiners, and the fees be divided among those who attend."

This was also agreed to.

(15) From Mr. Fearnley, of Leeds, to the President, desiring information on the course to be adopted in order to obtain the recognition of a veterinary school which he proposed to establish in Leeds.

The President: This letter was addressed to me by Mr. Fearnley, but I told him he had better address his enquiries to the Council.

(16) Letter to the Council to the same effect.

Professor Brown: I should propose that the Secretary be instructed to forward a copy of the Charter, and to state that all the information in the possession of the Council referring to the recognition of a veterinary school is contained in that document.

This was agreed to.

The Secretary announced that the officers of the Inland Revenue had called upon him in reference to the tax for armorial bearings, and he had subsequently paid one guinea as the tax on the arms used by the College on diplomas.

The Registrar read the obituary notice.

On the motion of *Mr. Owles*, seconded by *Mr. Naylor*, 250 copies of the "Register" were ordered to be printed.

The Report of the Finance Committee.

In this report the present liabilities were set down at £63 13*s.* 5½*d.*, which the Committee recommended should be discharged.

The Treasurer's report showed a balance at banker's of £67 13*s.* 8½*d.*

Mr. Naylor moved "That the report of the Finance Committee be received and adopted, and that cheques for current expenses and examiners' fees be ordered to be drawn."

This was seconded by *Mr. Silvester*, and agreed to.

The report of the House Committee was, on the motion of *Mr. Moon*, seconded by *Mr. Cartwright*, received and adopted.

Mr. H. T. Batt and Mr. John R. Cox were then appointed auditors.

Mr. Wilkinson, Mr. Fleming, Mr. Lowe, and the Secretary, were appointed as a Special Committee to draw up the annual report.

It was next resolved to hold the annual dinner at "The Albion," Aldersgate Street.

This concluded the business of the ordinary quarterly meeting, and the Council resolved itself into a special meeting to consider the alterations in the by-laws, of which notice had been given by *Mr. J. C. Broad.*

Special Meeting.

The proposed alteration in By-law 25, which would have the effect of abolishing the Christmas examinations in London, was first considered.

Professor Simonds said that it had been stated that the Christmas examinations caused a considerable but unnecessary expense to the College. This expense, however, was more apparent than real. If a candidate was rejected in April, he might again offer himself in December; but if the Christmas examination was abolished, the rejected candidates would have to wait until April in the following year, and thus greatly extend the April examination, which already was considered as occupying too great a period of time. It could not matter, so far as the pecuniary interests of the College were concerned, whether the rejected pupils were re-examined in December or in April. It had been said that the Scotch schools had only one examination, and therefore the London school ought not to have two. The cases, however, were not parallel. The Scotch schools commenced their instruction in the month of November, and ended before the English school did. The English and Scotch schools were therefore not upon a par. The interests

of the pupils, too, ought to be taken into consideration. The funds of the College were entirely derived from the fees from pupils, and therefore no difficulty ought to be thrown in the way in that respect. At present, if a candidate was rejected he was rejected for a period not less than three months. This could not, however, be the case in Scotland, where the session commenced in November; but at the Royal Veterinary College it commenced in October, which arrangement allowed of three months' instructions before Christmas. Mr. Broad's proposal, however, would require a pupil who had been rejected in April to attend the school until the following April, and it certainly was not consistent with the interests of the profession that this should be the rule. A man of money might easily stop that additional time, but poor men, who had only their talent to rely upon, might not be able to stay so long. It was, however, desirable, as much as possible, to encourage men of education and talent to enter the profession.

It was well known that the profession had sustained a very serious loss through the death of Professor Spooner, and it was equally well known that at the present time alterations were being carried out in the Royal Veterinary College, and that within the last few weeks the Governors of the College had taken a step which would go far to remove the objections that had been raised against the Christmas examination. They had determined upon the establishment of a summer session, which would commence in May and end in June. The educational year would thus be divided into two sessions: the one commencing in October, and continuing till the last day of March; and the other commencing in May, and continuing till the end of June. Surely then it would be most inconsistent for the Council to expect the pupils to wait till the following April before being examined. He trusted that Mr. Broad would see the matter in its proper light, and at once withdraw his proposition, which, if carried out, would do an immense amount of mischief, and very likely set the schools against the College. If it was found necessary to increase the fees, then let the increase be levied on those who appeared the second time for examination. In conclusion, he urged upon the Council to well consider the matter before it accepted the motion for the alteration.

The President said, after what Professor Simonds had said, he was convinced that it would be unwise to adopt the proposed alteration. At the same time, "what was sauce for the goose was sauce for the gander," and the Council ought to reflect upon the course they would adopt with regard to Scotland. In the event of a summer session being established

there, would the Council feel justified in sending over the examiners to examine possibly only half a dozen students?

Professor Brown said the Scotch schools always had as much right as the English school to a second examination in the year if they required it.

Mr. Greaves was exceedingly glad to hear of the changes in the London College, but he would certainly bind a rejected candidate to attend the summer session if he intended to offer himself for re-examination at Christmas.

The resolution fell through, not having been seconded. The proposed alteration in By-law 27, raising the fee to ten guineas, after having been seconded by *Mr. Harpley*, was, on the motion of *Professor Simonds*, seconded by *Mr. Gowing*, postponed until the Scotch schools, which were deeply interested in the matter, had been communicated with.

The proceedings then terminated.

CENTRAL VETERINARY MEDICAL SOCIETY.

The usual monthly meeting of the above Society was held at 10, Red Lion Square, on Thursday, April 4th, 1872; the President, George Fleming, Esq., F.R.G.S., in the chair.

After the reading and confirmation of the minutes, a letter was read by the Secretary from George Armatage, Esq., acknowledging his election as Honorary Fellow (this is the first honorary fellowship which has been conferred), and thanking the Fellows for the honour.

The President then submitted to the inspection of the Fellows a balling gun that had been forwarded by Messrs. Arnold, of Smithfield, the improvement consisting in a gutta percha tube being added to the popgun form of gun. A vote of thanks was accorded Messrs. Arnold for the presentation.

Mr. J. Woodger, senior, exhibited a specimen of anchylosed dorsal vertebræ. He had attended the horse, and kept it suspended by slings, the animal only lately showing symptoms of illness by falling when at work. The specimen represented seven posterior dorsal vertebræ, three joints of which were anchylosed. There was also considerable osseous deposits inferiorly. The spinal canal had not been opened.

Mr. F. J. Mavor referred to a case of anchylosis of spine complicated with absorption of the gluteal muscles and the pressure of spiculi of bone on the posterior aorta. Two instances of sagacity in the horses affected with this form of disease were

related; one, where the animal when resting at night was accustomed to place a fore-leg on the manger and drop the head on it; the other, when taken to the forge to be shod, being unable to bear the raising of either hind limb, always lying down quietly and allowing the removal and refitting of the shoes.

Mr. F. J. Mavor then read an extract from the *Medical Times and Gazette*, No. 1134, relating to the hypodermic injection of morphia and inhalation of chloroform producing complete anæsthesia with a much smaller quantity of chloroform than when given alone. He had written in the next number of the journal, to the effect that he had for some years employed the same method of injecting a full dose of morphia and giving one ounce of chloroform, thus producing unbroken sleep, which in one case he mentioned lasted nine hours.

The President then called on Mr. S. Price to read his paper on "Purpura Hæmorrhagica."

Mr. S. Price, in detailing the forms and character of the disease as affecting the horse, described it as a blood affection, or morbid condition of the arterial or venous coats. Dwelling on the suddenness of its attacking an animal, and the fatal termination it so often results in, he proceeded to treat of the various local evidences of its existence, and the *post-mortem* appearances, instancing the liver as much affected, and ascribing the origin of the disease to biliary congestion. The treatment he adopted consisted in administering gentle aperients, camphorated turpentine in ℥j doses, with gruel every three hours, with a view to reduce the swellings, following it up with nitric acid in ʒj doses twice daily. Fomentation he opposed, preferring to use the lancet.

At the conclusion of his remarks *Mr. F. J. Mavor* said, he held a different opinion to Mr. Price, because the disease affected horses in opposite conditions: he was disposed to consider the affection due rather to a loss of nerve power, and the consequent relaxation of the tissues, having regard to the rapidity with which the symptoms change to other parts of the body.

Mr. Moore observed, that the late Mr. Barlow, veterinary surgeon, a good microscopist, held it due to a breaking down of the blood discs.

Mr. Burrell contended, that in that case there was an alteration in the specific gravity of the liquor sanguinis.

Mr. Mavor said, if there be no specific change in the normal condition of the blood, why should not the result of the anæmic condition be dropsy; or, if the condition be general, why is there not general effusion?

The President also held it was not a blood disease; he considered it allied to scurvy in the human subject, save that the

gums were not so affected. The use of turpentine he advised, regarding it almost as a specific.

Mr. Hunting expressed an opinion that purpura was confounded with other affections, believing it impossible to have effusion without a rupture of the vessels.

A long discussion ensued on that point, the general opinion being that the redness was due to the effusion of hæmatine from the walls of the vessels.

Mr. Price afterwards replied to the observations made, and a vote of thanks was passed to him on the proposal of *Mr. Gowing*, seconded by *Mr. Woodger, senr.*

The President announced that Professor Tuson, of the Royal Veterinary College, was nominated as Honorary Fellow; and Mr. Axe, also of the College, was proposed as a Fellow; both gentlemen will be balloted for on the next night of meeting, Thursday, May 2nd.

It was then announced by the *President*, that Mr. F. J. Mavor would read a paper on the next night of meeting, the subject being, "Animal Heat and Rise of Temperature from Disease."

The meeting then adjourned. Present, 15.

James Rowe, Jun.,
Hon. Secretary.

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

A meeting of the West of Scotland Veterinary Medical Association took place at the "Athole Arms" Hotel, Dundas Street, Glasgow, on Wednesday, the 10th April, 1872.

Present—Messrs. Brownlie, Pollock, Blackie, Pottie, Prentice, Sharp, Robinson, Wm. Anderson, and the Secretary.

The President, Mr. Daniel McLean, occupied the chair.

The President directed the notice of the association to a disease which has been of late and is still very prevalent, namely, sloughing of the skin covering the coronet, heel, and pasterns. He remarked that it is a very obstinate disease, not yielding readily to treatment, and one which he thought that the society should make the subject of discussion. His experience of the disease had enabled him to affirm that the best means for producing a healthy action is the use of cantharides ointment in the proportion of about 1 to 8. He objected very much to carbolic

acid in the treatment of these cases, as he had tried it repeatedly, and found that invariably it produced deep-seated inflammation and retarded the healing process.

Mr. Robinson was of opinion that the disease is carbuncular in its aspect. He corroborated the statements of Mr. McLean with regard to the obstinate nature of the disease. He upheld, however, the carbolic acid system of treatment, and said that he used digestives freely along with the carbolic acid, which he thought essential in order to bring about healthy granulations. He also approved of cantharides ointment, having used it occasionally in aggravated cases.

Mr. William Anderson was of opinion that the disease was caused by irritating matters, conjoined with application of cold and wet to parts naturally sensitive. He ascribed its more than ordinary prevalence to chemical refuse in the streets, which cannot be altogether avoided in our busy thoroughfares.

He thought that where tramway operations are going on the chances are greater of contracting the disease. Had known instances of horses in which the unhealthy sloughs had taken place very rapidly where they had been daily worked on streets where the tramways were being laid. The man in charge had frequently attributed the disease to the materials used in laying the tramway.

Mr. McLean remarked that he had noticed the disease to be more common among the omnibus horses which go to and from the Botanic Gardens, where the line of tramway was being laid.

Mr. Pottie said he could not see how that could cause the disease, as it exists in places where there are no tramway operations going on.

He also spoke at some length on the nature of the disease; and his theory being that there was a stoppage of the circulation at and around the affected part, which accounts for its obstinacy to heal. Gangrene and death of the part take place, and as a result there would necessarily be sloughing of the skin. His treatment consisted of poulticing until he had removed the inflammation, and afterwards the application of cantharides ointment. After sloughing had taken place he used alum and acetate of lead in equal parts, made into a paste with water. He had tried various means besides these, and had sometimes found that after the healing of the sore sloughing would again take place, and ulceration recur. He had observed deep cicatrices and indurations as a final result.

Mr. Pollock said that he had seen a good many cases in pit horses and carriage horses, as well as heavy horses.

Mr. Robinson remarked that œdema of legs was often associated with the ulceration.

Mr. Pottie asked why in the human subject patients did not swell in the legs?

Mr. Robinson—Œdema is very common in the human subject.

Mr. Pottie—Œdema, according to my theory, takes place from impediment of the venous circulation. The venous circulation is influenced by gravitation, compression of muscle, &c., and when a vein is injured the circulation in the part immediately behind becomes impeded, and all the neighbouring plexuses become congested and cause œdema.

Mr. McLean remarked with regard to cracked heels, that if you allow a horse's heels to be washed and not dried, he will be apt to become affected. Would a concrete of wax, or some such article, not be useful as a preventive of cracked heels?

Mr. Robinson—I do not think it would do good, but rather aggravate the disease, as dirt would collect on the part.

Mr. Anderson—It is only a certain class of horses (well bred) which suffer from cracked heels in consequence of exposure to wet and cold. Some rough Clydesdale horses are in the habit of fording rivers daily for years, and show no symptoms of cracked heels.

Mr. Robinson—Certain horses in Greenock have to ford rivers, and are not injured by so doing.

Mr. Anderson—I know a gentleman who purchased a great many horses which were suffering from grease and cracked heels, and cured some of them by making them walk in the salt water on the shore.

Mr. Pollock next drew attention to a peculiar case of partial paralysis of the hind extremity, which had lately come under his notice. The animal dropped suddenly; the pulse rose to 90; the urine was of natural colour.

Mr. Sharp remarked that about three weeks ago an animal which had been under his treatment for paralysis died. The *post-mortem* examination presented atrophy of the right kidney. The left one, however, was fully three times its natural size. The right one also contained some clotted blood.

Mr. Anderson—Allow me now to bring before you a case of some interest which I had some time ago under treatment. A thorough-bred horse had an abscess on the inner side of the thigh. I had him cast, and opened the abscess. Six days after, he died, when a *post-mortem* examination revealed a large clot of blood around the right kidney, and also a rupture of Glysson's capsule of the liver. Hæmorrhage had taken place. Casting had probably injured the liver.

Mr. Pottie—I had the opportunity of seeing a peculiar case in a cow of a swelling on the pubic region. It had been opened by the owner previously to my seeing it, and a large quantity of

clotted blood was taken from it. I applied a bandage so as to compress it, as I could not pin up the skin, in consequence of its being so tender. The case required no further treatment.

Mr. Robinson stated that he had seen a bloody abscess so large that many large masses of clotted blood, sufficient almost to fill a pail, came away. The wound ultimately healed kindly.

Mr Pollock related a case of a cow which had a swelling on her back, measuring 3 feet wide and 2 feet long. After opening it, it was found to contain serum and blood-clots. He treated it by fomentations only. It did well.

This brought the meeting to a close. Mr. Prentice kindly consented to bring a paper before the next meeting.

JAMES ANDERSON, *Hon. Sec.*

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE twenty-first general meeting of this association was held at the "Hen and Chickens" Hotel, Birmingham, March 26th, 1872, the President, F. Blakeway, Esq., of Stourbridge, in the chair.

There were also present Messrs. Proctor, Coventry; Pyatt, Nottingham; Markham, Rugeley; Carless, Stafford; Price, jun., Birmingham; Hill, Wolverhampton; the Secretary, &c.

Letters of apology for non-attendance were received from Messrs. Greaves, Manchester; Dayus, Dorrington; King, Melbourne; Rossell, Sandiacre; Perrins, Worcester; Cartwright, Whitchurch; Martin, Chesterfield; and Colshaw, Derby.

A letter was also read from Mrs. Spooner in reply to the letter of condolence which had been forwarded from the association.

The minutes of the last meeting were then read and confirmed, and the accounts for the past year having been audited were adopted. Several members being in arrear with their subscriptions, the Treasurer was requested to write them, intimating that unless such arrears were paid before next meeting Rule IV would be enforced.

This being the time for the election of officers, F. Blakeway, Esq., was unanimously re-elected President; Messrs. Pyatt, Price, and Hill were elected Vice-Presidents; Mr. A. B. Proctor re-elected Treasurer; and Mr. M. Palfrey was elected Secretary.

A circular received from the North of England Association was read and discussed, and the President was requested to convey to

Mr. Meikle, their Secretary, the opinion of the meeting on the questions therein contained. Some interesting specimens of navicular disease were laid upon the table by the President, and elicited an animated discussion.

The annual meeting and dinner were arranged to take place a the "Midland" Hotel, Derby, on the 23rd day of July, at 2.30 p.m., when the President will deliver the Inaugural Address. All members of the profession are invited to attend.

A vote of thanks to the Chairman brought the proceedings to a close.

M. Palfrey, *Secretary.*

PARLIAMENTARY INTELLIGENCE.

House of Commons; *April 4th.*

SHEPHERDS' DOGS.

Mr. F. Powell gave notice that in Committee on the Customs and Inland Revenue Bill he should move to exempt from taxation dogs which were *bonâ fide* used in the care of sheep and cattle.

April 9th.

THE PRICE OF MEAT.

Mr. Muntz inquired whether it was the intention of the Government, taking into consideration the extraordinary price of meat, and the serious reduction in the stocks of sheep and cattle, to advise her Majesty to issue a Royal Proclamation (in accordance with former precedents) enjoining all loyal subjects to abstain from the use of veal and lamb until such time that the stocks of cattle and sheep should have regained their former numbers.

Mr. Gladstone—I am obliged to give a decided answer to my hon. friend in the negative, at the same time admitting that I have very considerable sympathy with the spirit of his question. It is not possible, in my opinion, for her Majesty with any advantage to attempt to issue a Royal Proclamation which would be in the nature of a sumptuary law. (Hear, hear.) It would not be obeyed, and it would tend to bring authority into discredit rather than serve the object in view. Considering the object to be the suppression of gross and needless waste, and the contribution, as far as lies in our power, to an abundance of animal food for the increasing wants of the country, I heartily wish

there were any legitimate means by which that purpose could be promoted; but I do not think that a proclamation of the kind suggested would be either becoming or expedient.

NEW MEMBERS OF THE PROFESSION.

At the several meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, held on April 15th, 16th, 17th, 19th, and 20th, the following students at the Royal Veterinary College, London, received the diploma of the College, and were admitted members of the profession:

April 15th.

Mr. Ernest James Bath	Gloucester.
— Iles Matthews	Stratford.
— Augustus Herbert Batchelor	Brixton.
— Samuel Hunt Perry	Ibstock, Leicestershire.
— William Hall Hinde	Lowestoft.
— John Johnson	Bishop Auckland, Durham.
— Thomas Briggs	Prestwich, Manchester.
— Miles Augustus Baker	Holt, Norfolk.
— William James Arkcoll	Leek, Staffordshire.
— William Hutchinson	Great Eccleston, Lancashire.
— Charles Middlehurst	Liverpool.

April 16th.

Mr. Michael Patrick Greene	Corbally, Co. Clare.
— William Hambly Lower Clark	Saltash, Cornwall.
— Harvey Collett	West Bromwich, Staffordshire.
— Henry Joseph Hancock	Uxbridge.
— Osborn Joseph Hills	Leamington.

April 17th.

Benjamin Hill Russell	Capt. Bengal Army, Swanscombe, Dartford.
Mr. Peter Avis	Uckfield, Sussex.
— Charles Walter Emms	Ilminster, Somerset.
— Stephen Beeson, Jun.	Chalfont, Bucks.
— Henry Jarvis	Burwash, Sussex.
— Samuel Wiltshire	Hanley Castle, Worcestershire.
— John Litt	Shrewsbury.
— John Henry Brown	Ludborough.
— George Thomas Vessey	Christchurch, Hants.
— John Wm. Atkinson Secker	Knaresboro'.

April 19*th.*

Mr. John Burton	Paington, Devonshire.
— Thomas Bartlett	Torquay.
— Edmund Phillip Dwyer.	London.
— Richard Hudson	Retford, Notts.
— William Joseph Johnson	Waterford.
— Thos. Butcher Scott Dawkins.	Aldershot.
— Alfred William Hall	London.

April 20*th.*

Mr. Charles Edward Challinor	Rudlebury, Manchester.
— Edgar Willmott Wright	Yoxford, Soffolk.
— Benjamin Eggleton	Maidenhead, Berks.
— Charles Arthur Good	Lymington, Hants.

At the meetings of the Court of Examiners of the Royal College of Veterinary Surgeons, held in Edinburgh on April 17th and 18th, the following students of the Edinburgh Veterinary College passed their examination, and received the diploma of the College:

April 17*th.*

Mr. William Hoole	Heckington, Lincolnshire.
— James Young	Banbridge, Ireland.
— Robert Herbert	Currie, Edinburgh.
— William Flannery	Cork.
— Andrew Balfour	Kirkcaldy, Fifeshire.
— James Kean Grainger	Jedburgh, Roxburghshire.
— George Metcalfe	Settle, Yorkshire.
— Alexander Lawson	Manchester.
— Andrew Kershaw	Middleton, Manchester.
— John Anderson	Bourtie, Aberdeenshire.

April 18*th.*

Mr. William Donaldson	Anstruther, Fifeshire.
— William Hasleden	Bolton, Lancashire.
— William Wheatley	Shotley Bridge, Durham.
— James Brodie Mills	Pollakshields, Glasgow.
— Arthur Albert Macfarlane	Greenock.
— Thomas Wilkinson	Dipton, Durham.
— George Tait	Elgin, Morayshire.
— George James Richards	Scarboro', Yorkshire.
— George E. Bowman	Elvington, York.
— William Johnston	Lockerbie, Dumfriesshire.
— Thomas Reilly	Navan, Co. Neath.
— John Cammack	Benington, Lincolnshire.
— Adam Walker	Luss, Dumbartonshire.

At a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons, held in Glasgow, on April 16th, the following students from the Glasgow Veterinary College passed their examination and received the diploma of the College :

April 16th.

Mr. Thomas Baty	Hexham, Northumberlnnd.
— Archibald Park	East Kilbride, Lanarkshire.
— James Struthers	Stirling.
— William Panton	Blairgowrie, Perth.
— Gavin Burns Miller	Glasgow.
— William Crawford	Glasgow.
— David McGill	Ayr.
— William Boyle	Glasgow.
— John Howatt	Pollokshaw, Renfrewshire.
— John Young	Hamilton, Lanarkshire.
— William McIbraith	Cawder by Bishopbriggs.
— William Anderson	Glasgow.

At a Special Meeting of the Veterinary Board of Examiners, held in Glasgow on April 16th, in accordance with the resolution of the Council for the admission of candidates holding the Highland and Agricultural Society's certificate :

Mr. Charles Moir . . Cardiff, S. Wales.

MATRICULATION EXAMINATION.

The following gentlemen have passed the Matriculation Examination, previously to entering on their studies at the Royal Veterinary College :—

Mr. R. R. Cole, Hinckley, Leicestershire.
„ T. Thursfield, Bridgenorth, Salop.

Two other candidates were rejected.

PRESENTATION OF AN ADDRESS TO PROFESSOR TUSON, BY THE STUDENTS ATTENDING THE CLASS OF PRACTICAL CHEMISTRY AT THE ROYAL VETERINARY COLLEGE.

On the 7th ult., an address, of which the subjoined is a copy, was presented to Professor Tuson by the pupils of the Royal Veterinary College, who had attended the course of laboratory instruction in practical chemistry.

"To

RICHARD V. TUSON, Esq., F.C.S.,

Professor of Chemistry and Materia Medica

in the

Royal Veterinary College.

"Sir,—We the undersigned Students of the Royal Veterinary College beg to acknowledge most heartily the efforts you have made to facilitate the acquirement of a practical knowledge of such a difficult subject as chemistry. While our opportunities for studying this important science were confined to those afforded by attendance on lectures only, the facts and principles of this branch of the curriculum were retained in the memory with extreme difficulty, but since we have had the privilege of working with our own hands in the laboratory, we find that we make greater and more rapid progress, and that we can more thoroughly appreciate the value and practical utility of chemistry to every one desirous of following the profession of veterinary medicine on sound and rational principles.

"We also beg to congratulate you on your being the first to establish a course of laboratory instruction in the oldest and principal veterinary college of this country; to thank you most sincerely for the sacrifice of your valuable time which you have voluntarily and gratuitously made for our benefit and advancement; and to hope that you may long be spared to participate in that in which you have manifested such a deep interest, *videlicet*, the education and elevation of the social status of the veterinary student."

Here follow the signatures of seventy-seven students.

ERRATUM, APRIL NUMBER.

Page 274, 4th line, *for* "muscles" *read* "nerves."

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Communications and Cases.

THE VETERINARY INTERNATIONAL CONGRESS AT VIENNA.

By G. Fleming, M.R.C.V.S., Royal Engineers.

As the readers of the *Veterinarian* are probably aware, a congress or conference, due to the initiative of Austria, has been recently held at Vienna, with the object of arriving at some definite conclusion with regard to the measures most likely to be successful in limiting the spread of the Cattle Plague. A summary of the proceedings of this congress has just reached me, having appeared in the *Brussels Veterinary Journal* for May; and as it may be of interest to the members of the veterinary profession in this country, from more than one point of view, I beg to submit it for their consideration.

The assembly was composed of delegates from nearly every government in Europe, as all are more or less liable to suffer from visitations of this bovine and ovine scourge, and some have in recent years been submitted to serious loss and inconvenience through its ravages.

On the 16th of March His Excellency the Austrian Minister of Agriculture proceeded to open the conference, which was held under the auspices of the Austro-Hungarian government, and was chiefly called upon to deliberate on the uniform measures to be adopted by every country in Europe against the propagation of this plague.

The questions which were to serve as a basis for the deliberations had been formulated by the Austrian government, conformably to a project elaborated by the teaching staff of

the Royal and Imperial Institute of Veterinary Medicine at Vienna. These questions, sixty-three in number, may be thus summarised:

a. Is Russia in a position to take efficacious measures for preventing diseased or suspected cattle crossing its frontiers into other countries?

b. What are these measures, and what are the conditions to which the passage of these cattle to the frontier must be subordinated?

c. If Russia cannot furnish every desirable guarantee, must it be necessary to interdict entirely the importation of Russian cattle, or will it suffice to submit this importation to certain conditions?

d. If the importation of raw animal products derived from Russia is permissible, what are the conditions to which it should be subjected?

e. What are the precautionary measures which ought to be observed during the passage of cattle and raw animal produce imported from Russia? How must the means of transport be disinfected?

f. What are the general principles on which proceedings should be taken whenever it is necessary to abolish the ravages of Cattle Plague beyond Russia?

g. To what restrictions ought the traffic in cattle and raw animal produce coming from the Roumanian Principalities, Servia, and Turkey, to be submitted?

The German Empire, France, Switzerland, Russia, Turkey, Italy, Servia, the Roumanian Principalities, and Great Britain, responded to the invitation by sending delegates to the conference. At the installation meeting, the imperial and royal minister welcomed, in the name of the Emperor of Austria, these representatives; after which the assembly was occupied in arranging its prospective task, when it was decided that two committees should be formed, one to examine the preventive, the other the repressive measures relative to the Cattle Plague. The first of these committees having terminated its labours in nine and the second in ten meetings, the members met in general assembly on the 2nd of April, when the replies furnished by the committee to the various questions were enunciated, and the whole matter discussed with regard to the principles which ought to serve as a basis for an international regulation against the disease. To sum up these discussions, it appears that the assembly recognised:—

a. That in the present state of affairs in Russia, that

country is not in a condition to guarantee that its frontiers will be passed only by healthy animals, free from Cattle Plague contamination.

b. That, consequently, there was reason that the importation of cattle should be submitted to the conditions determined by the conference.

The minority of the assembly were in favour of the absolute interdiction of cattle, as well as of raw animal produce, from Russia.

The delegates were also agreed as to the principles which should control the transport of these cattle and products, as well as on essential measures to be adopted if the malady broke out beyond Russia.

With regard to the Roumanian Principalities, the assembly was of opinion that the veterinary service being organized in a satisfactory manner in that country, and police measures properly enforced, there was no occasion to have recourse to exceptional measures there; though it was not the same with Turkey and Servia.

After having decided the official questions, the assembly was occupied with some propositions which, at the request of several delegates, had been discussed at one of the committees. Two of these propositions had reference to the precautionary measures to be adopted with regard to burying places for diseased cattle, as well as to what was to be done with hay, straw, and unthrashed corn or wheat, rendered suspicious in consequence of being impregnated with the emanations of an infected cow-shed; a third was relative to the official communications by which the government of any country should announce to the authorities of other countries every outbreak of Cattle Plague within the frontiers, and to keep these authorities duly informed of the progress of the disease, as well as the measures prescribed to prevent its propagation.

On the occasion of a fourth supplementary proposition the conference declared that, in its opinion, no government should bestow an indemnity for the slaughter of a drove in which the malady had appeared, unless the drove had been at least ten days in the country, or unless it was proved that it had been contaminated in the country.

The proposition to include the Cattle Plague in the list of unsoundness for which the vendor is responsible up to a certain time after sale, was rejected by the majority of the assembly.

The conference terminated its labours by discussing the whole of the principles which should form a basis for international regulations against the malady, but as only a brief

summary of what was done at the conference has reached us, we must wait for details before we can judge of the value of these principles, or the possibility of their being adopted in their integrity.

In the meantime, it may not be amiss to draw attention to what would seem to be a singular feature in this conference, viz. the absence of a representative of veterinary science from England. Let us see how other nations,—some of which, we should be inclined to think, were much behind ourselves in veterinary and sanitary matters,—were represented.

Germany sent H. Müller, Professor at the Berlin Veterinary School, and H. Probstmayer, Director of the Munich Veterinary School, and an official connected with the Bureau of the Minister of Agriculture.

Austro-Hungary had H. Röll, Director of, and Müller and Brückmuller, Professors at, the Veterinary Institute of Vienna, with three non-professional representatives, and H. Zlamal, Professor in the Imperial Veterinary Institute of Pesth.

Belgium was represented by M. Wehenkel, Professor at the Brussels Veterinary School, and the Inspector-General of Agriculture.

France, by the talented Veterinary Professor, M. H. Bouley.

Italy, by Count Ercolani, Professor, and Perosini, Director, of the Veterinary School of Turin.

The *Roumanian Principalities* had H. Colben, Veterinary Surgeon, and a sanitary officer.

Russia delegated Rawitsch, Veterinary Professor and Councillor of State, and Professor Seifmann.

Switzerland sent M. Zanger, Director of the Veterinary School at Zurich.

Great Britain was represented by Dr. Williams, Secretary to the Veterinary Department of the Privy Council.

It will thus be seen that, of all the principal European nations who sent delegates to this conference, Great Britain was conspicuous in the absence of a professional representative.

It may be said in explanation that the Conference bore more of an international-legal than a scientific complexion, and that a gentleman who had a full acquaintance with the legal enactments relating to cattle importation and cattle disease returns in this country would be a much better representative than a veterinary authority.

The nature of the subjects discussed at this Conference would, however, seem to have been chiefly professional; and

other countries appear to have understood that this was likely to be so better than our own, and consequently sent distinguished veterinarians to lend their aid in solving some of the most urgent questions connected with veterinary sanitary policy. Ought not we to have done the same?

OBSERVATIONS ON PORRIGO OR TINEA.

By A. E. Macgillivray, V.S., Banff.

(Second Communication.)

In my previous paper on this subject I remarked that I had met with three varieties of *porrigo* in the lower animals, namely, *favosa*, *scutulata*, and *decalvans*.

The designation "*porrigo*" has now become almost obsolete, having been superseded by the more appropriate one of "*tinea*;" so that we now find *T. favosa*, *T. scutulata*, and *T. decalvans*, used to specify the three varieties of the affections under discussion (*vide* 'Hillier's Handbook of Skin Diseases,' 1865).

The second of these, *T. scutulata*, is by common consent called *ringworm*, and is itself, in the human subject, by some authorities subdivided into three distinct varieties, known as *T. tonsurans*, or ringworm of the head; *T. circinata*, or ringworm of the body; and *T. sycosis*, or ringworm of the beard (*vide* 'McCall Anderson's Monograph on Parasitic Skin Diseases,' 1868, which author, by the way, styles ringworm *T. Tricophytina*).

In my former communication I mentioned several instances where *T. favosa* had been produced in the human subject by contagious matter from *T. scutulata*, or ringworm of the lower animals, and how common it was for the latter to be transmitted from the lower animals to man, and that from these facts I considered that the two affections, *T. favosa* and *T. scutulata*, owed their origin to one and the same parasitical fungus.

I also stated that, after minute and extensive investigations in two cases of *T. decalvans*, respectively in a hare and a dog, I considered this variety of tinea also to be caused by the ravages of the same parasitical fungus.

It seems, however, that many eminent dermatologists, both British and continental, maintain that the three principal varieties of *tinea* mentioned above are caused by three different and well-defined microscopical fungi; and that the

spores of the fungus of *favus* will not under any circumstances produce *T. scutulata*, nor, *vice versâ*, will the spores of *T. scutulata* in any case produce favus.

The fungus *Achorion Schœnleinii* is said to be restricted to favus; while *T. scutulata* is caused by the *Tricophyton* fungus, and *T. decalvans* by the fungus *Microsporon Audouini*.

On the other hand, several medical authorities of unquestionable ability, such as Dr. Tilbury Fox (in his 'Skin Diseases of Parasitic Origin'), and Mr. Jabez Hogg (in the 'Quarterly Journal of Microscopical Science,' January, 1866), as well as several continental investigators, maintain that all the varieties of this vegeto-parasitical skin affection, however glaringly dissimilar their external appearances may be, are caused by the presence of one and the same parasitical fungus.

It were needless to deny, for instance, that the outward symptoms seen respectively in a case of favus and a case of *T. decalvans* are extremely conflicting. Still, if we bring the microscope to bear on the subject, little or any apparent, and I think no actual, difference will be found in the character and arrangement of the spores, sporophorous tubes, and mycelium composing the parasitical fungi present in the two varieties of the affection mentioned.

The real cause of the varied appearances presented by the action of the fungus in the several forms of this affection must be looked for in the *soil*, so to speak, in which it is found vegetating, and also in the particular part of said soil (the skin and its appendages) in which its various phases are observed. It may be superficial, deep seated, or entirely capillo-follicular.

Since my previous communication I have conducted a series of four experiments in order to test the results of transmitting the contagious material of common ringworm in cattle to *cats*, *rabbits*, and *pigs*; being fully convinced that *T. favosa* often follows upon its transmission to man, I concluded that I ought to find corroborative evidence in its effects on these smaller animals. The following details will show whether my conjectures were correct or otherwise.

First experiment.—Having with a scissors removed the hair from a small spot on the head of a young white rabbit, I moistened the bare spot with a little spittle, and then well rubbed upon it a small quantity of contagious powder or dust scraped from crusts on the head of a yearling quey suffering from common ringworm, or *T. scutulata*. The crusts on this quey were of the usual dirty whitish-grey colour. On ex-

amining the spot on the rabbit's head ten days after, I found considerable irritation present, scalp somewhat raised, and surrounding hair becoming loose. Four days subsequently five distinctly marked achores or pustules had appeared within the circumference of a shilling piece; these achores were of a light yellow colour, with some slight surrounding inflammation, and with evident depressions in their centres. In fact, their resemblance to the *favi* which I had seen in the human subject was unmistakeable and complete; and the subsequent superincumbent crusts, which appeared in this rabbit, only tended to render the analogy more decidedly unquestionable. At first the crusts were comparatively isolated, but in a few days they coalesced into one large, semi-transparent, deep yellow, irregularly shaped scar or crust.

Second experiment.—I proceeded in exactly the same way with a two months' old pig. Contagious matter from same source was used, but no symptoms of either form of tinea, or any other bad effects, followed the application.

Third experiment.—The subject of this experiment was an aged grey rabbit, and precisely the same course was adopted as with the first rabbit. After the lapse of three weeks I examined this rabbit, and found a circular spot presenting all the well-known symptoms of *T. scutulata* or ringworm; the overlying crust was dark grey (slightly tinged with yellow) in colour; was pretty deep; was irregularly rough on the surface; softer and much more easily reduced to a powder than that of the first rabbit experimented on.

Fourth experiment.—This, the most interesting of the whole series, was performed on a six weeks' old kitten. As in the other cases, a spot was bared on the head, well moistened, and rubbed with contagious dust from the crusts of common ringworm on a half-year old calf. After the expiry of eight days a patch of the skin on this spot, about the size of a sixpenny piece, became slightly elevated and irritable-looking. On examining this diseased spot with a pretty strong object-glass, I perceived that the greater part of the hair or fur had lost its normal appearance, and become ragged and broken; and there appeared to be some slight exudation of a glairy-looking matter over the whole spot, which exudation seemed to come from the hair follicles; but as yet, however, there appeared no signs of any achorial eruption. This was on the twelfth day. On the sixteenth day three flattish, pustular-looking bodies were discovered; they were of a bright yellow colour, and were perceptibly depressed in their centres. Three weeks and two days after

the application of the contagious material, one irregularly circular crust, semi-transparent dark yellow in colour, covered the spot where the three introductory achores or *favi* had been.

What rendered this the most attractive and interesting of the series of experiments, however, was the fact that an isolated achor or favus appeared at the root of one of the claws of the left fore foot. The earlier stages of the disease on the head seemed to be accompanied with considerable pruritis, in consequence of which the paw had been brought into use, and so received contagious matter sufficient for a fresh establishment of the parasite. The pustule, so to speak, at the root of the claw presented the usual colour and form, and was followed by a most beautiful cup-shaped favous crust, thus leaving no doubt as to the affection being the genuine *T. favosa*.

No treatment was adopted to rid either the rabbits or kitten from the attacks or effects of the fungous parasite which had thus wilfully been brought home to them, as I intended to destroy them in order that I might have an opportunity of thoroughly acquainting myself with the nature and habits of the parasite.

This concludes the necessary details as to the series of experiments entered upon to ascertain whether or not *T. favosa* may follow on the receipt of the contagious matter of *T. scutulata* or common ringworm in cattle; in fact, to settle whether or not both affections are caused by one and the same vegetable parasite. I will now offer a few remarks as to the conclusions which may be drawn from the results of these experiments, as well as from the data brought forward in my former communication.

Whatever form the effects of the parasite may assume externally, or, in other words, whatever external symptoms may be present (carrying with them the title *favus*, *scutulatus*, or *decalvans*, as may happen), I think there can be little doubt that a close and impartial microscopical investigation will reveal extremely little, if any, actual difference in the causative fungus and its component parts and their arrangement. So that whether we style the fungus Achorion, Tricophyton, or Microsporon, according to its externally apparent effects, the fact remains that the fungus in each case is one and the same vegetable parasite.

The truth of this is demonstrated: first, by microscopic investigation, which shows us that any seeming difference that may occur is simply a change in the size or arrangement of the spores; a greater or less quantity (and, perhaps, slight

variety in the position) of the mycelia or filamentous mass in which the spores are usually imbedded; or finally, mayhap, some dissimilarity in the quantity and character of the sporophorous tubes (query, how much of all this is due to the various manipulations and soakings in dilute liquor potassæ, &c., during our investigations?) The characteristic component parts of the typical fungus are found alike in every variety of the affection, at least I have found it so.

Second, by the contagious material of one variety of tinea producing, under other circumstances, or in a different nidus, another variety of tinea: such as *T. scutulata* in the ox producing favus in the human subject, in the cat, and in the rabbit. I have already adduced examples of this, and will now refer to the opinions of Dr. Tilbury Fox and Mr. Hutchinson on the subject.

There is, in the human subject, a peculiar variety of this disease named *T. versicolor*, which is said to owe its origin to the fungus called *Microsporon furfur*, but Mr. Hutchinson (*vide* 13th volume 'Pathological Transactions') has several times seen this *T. versicolor* produced by contagious matter from a case of *T. tonsurans*, which latter is itself, as already mentioned, a subvariety of *T. scutulata* and the product of the *Tricophyton* fungus. Mr. Hutchinson by actual experiment verified his observations, thus producing the *Tricophyton* from the *Microsporon furfur*.

Dr. Tilbury Fox mentions, in the second edition of his 'Manual of Skin Diseases,' p. 349, that he has found *T. versicolor* to follow the implantation of the spores of the *Oidium albicans* which is the fungus found in thrush or aphtha. I consider it worthy of notice that this *Oidium albicans* is the fungus supposed to be present in "foot-and-mouth" disease (see Mr. Fleming's paper on the subject in the *Veterinarian* for December, 1869).

A good few microscopists of unquestionable ability maintain that not only are the parasites of all the varieties of tinea identical, but that they are also one and the same as the *Aspergillus glaucus* (*vide* Dr. John Towe's observations and experiments in the fifth volume of the 'Transactions of the Botanical Society'). Now this *A. glaucus* is neither more nor less than a fungus which is often found in *diseased oats*, generally causing an immense amount of mischief. A good representation of this fungus will be seen in the *Veterinarian* for March, 1870, being magnified 200 diameters; and I feel certain that any one who has (personally) closely examined the arrangement and component parts of the tinea parasite will at once allow that the resemblance between it and the

aspergillus parasite, as here delineated, is the next thing to being complete.

It would account for a good many outbreaks of ringworm if the aspergillus and tinea parasites turned out to be identical. But I must pass on to notice that—

Third, the identity of the parasites present in the several varieties of tinea may be indirectly proved by an examination of the various seats or *nidi* where they are found vegetating. From observations made on the subject of the experiments above detailed, I have come to the conclusion that the external symptoms presented in all the varieties of tinea, however conflicting, depend entirely on the particular part of the integument, and the constitution and species of the patient, in which the disease (parasitical) has established itself.

Favus is almost invariably deepseated, the dermis, epidermis, and hair radicle becoming alike infested. *Scutulatus* or ringworm is in general more superficial, mostly confining itself to the hair follicle, hair, and epidermis. Decalvans almost restricts its attack to the hair alone, hence the want in a great measure of the usual apppearance of epidermic disturbance.

It may, therefore, be set down as a rule that in accordance with the *seat* of the disease will the external symptoms be.

These deductions are quite compatible with what we know of the habits of other members of the fungus family. For example, let us take the common edible mushroom (*Agaricus campestris*), and we will find that it assumes an immense variety of shapes, and sizes, and appearances; more than this, however, we find that although in most situations and soils it is safely edible, yet when found in low-lying, secluded, unhealthy places, or near stagnant pools, it becomes virulently poisonous. The situation changes the nature and quality of the *A. campestris*, and in like manner the shape and colour of the tinea parasitical fungus and its effects.

But, as I find the subject is as inexhaustible as it is interesting, I must conclude my remarks, and let some one else with more time and ability resume its consideration. I have simply given my own experience and consequent ideas, and must just leave them to speak for what they are worth.

RECORD OF A CASE OF TETANUS.

By W. Copeman, Esq., Whitchurch.

Subject, a mare, about fourteen years old, healthy, strong, and active, employed regularly in farm work. She had been ten years in my possession, and with the exception of being lame in one hind leg from a strain received some six or seven years ago in shafting a heavy load down hill, was in health up to the time of her attack. The mare had been working all day as usual, Monday, May 6th. On Tuesday morning she was found ill; refused her food, and had apparently some swelling or affection of the tongue. She had dunged as usual during the night, but had not eaten any hay. Her tail was somewhat erect and turned to the near side; her hind legs were wide apart and her fore legs straight and stiff; her head was stretched forwards; the eyes were dull and ears erect. She walked with difficulty. There was some trembling and also difficulty of breathing. The true nature of the case not being as yet discovered, her back was ordered to be rubbed with mustard and vinegar, and injections of soap-and-water and an oleagenous drench were prescribed. The injections brought away only natural fæces, but the drench could not be administered, *apparently* through the determination of the mare to *resist* it (she was of a very vicious, *dangerous*, and nervous temper). Her throat was well rubbed with a stimulating liniment, and the injections being repeated, she was left for the night. She seemed *ready* for food, but could not masticate it, and the breathing was more laborious and difficult. Pulse about 40.

Next morning, 6 a.m., she was pronounced hopeless, but the nature of her illness not being *then* discovered, another opinion was sought, and the disease was found to be lock-jaw. The rectum was examined, the bladder emptied, and an injection of four ounces of laudanum administered. The pulse numbered 50; breathing very difficult. Considerable restlessness was present, the mare turning every now and then (about every five minutes) round the loose box, always from *right* to *left*. These symptoms continued to increase in virulence, accompanied by profuse *sweating*, and apparently great agony, and excessive *trembling*, on her being disturbed or interfered with. In the afternoon the veterinary surgeon visited her again, when, with a view to relieve the intensity of the symptoms, she was bled about five or six quarts, and imme-

diately afterwards half a drachm of prussic acid was administered by injection into the rectum. She was then left again for the night, but in the course of an hour she was *dead*. Duration of illness about thirty-six hours.

She had not received (as far as could be ascertained) any wound or injury, but there was a *small* abscess on the back, which had existed several days, and had suppurated. She had been exposed, in her every-day work in the field, to the extreme inclemency of the weather—cold, pelting showers of hail, sleet, or rain, but was, in all respects, similarly treated to the other horses, and had a comfortable *stall* stable. Her food consisted of good clover hay, some mangold wurzel (of which the horses are very fond), and some oats and bran. There was nothing unusual in her general treatment to account for the illness.

Throughout the illness, the tail was somewhat firmly erected towards the left side. The jaws, also, were *firmly* clenched. The breathing became gradually more *hurried*, *difficult*, and *sonorous*, and the *agony* seemed to be *great*. The muscles of the neck were very rigid and hard, and the muscles of the abdomen developed themselves very much in the efforts of breathing. The mare in turning round did not *bend* any part of her, and the straw on which she stood became twisted into a sort of rope about her legs.

Post-mortem examination.—The day after death, that is to say, about thirty-six hours, she was opened. First, the jaws and throat were examined, and a slight scratch or two were seen on the tongue and near the grinders on the side of the mouth, from which a little blood had been seen during life to fall. The trachea, fauces, and larynx were *stained* with dark blood. The heart was similar, but it did not contain any coagulum, only some dirty-looking blood-like fluid. The pericardium was rather full of serum. The lungs were healthy, but on one side were rather gorged with blood, as if from gravitation after death; and so with the other organs, which all appeared free from inflammation. The liver was rather *soft*, and of a *dirty-earthy* colour, *approaching* blackness, on the depending side. The kidneys seemed healthy, and likewise the stomach and bowels. The stomach contained no solid matter, but a few pints of fluid stained of a yellowish colour. The contents of the *colon* were similar. The small intestines contained a small quantity of digested matter. The mare was *fat*. No fluid was found in the head, and the cerebrum and cerebellum seemed healthy, the blood-vessels not being at all gorged. The spine was not examined. A few patches about the intestines were

stained of a dark colour, but did not seem to be the result of inflammation. The carcase seemed to be passing rapidly to decomposition, as it was distended with gas, and emitted a strong smell. The blood, which had been extracted about an hour or so before death, was allowed to stand in the bucket for a day or two. It had not separated at all, but was a mass of dark-coloured clot, firm enough to retain the shape of the bucket when turned out, and was free from smell.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 318.)

The *Cannabinacæ*, or Hempworts, includes two genera, one of which, the *Humulus Lupulus*, or Hop, is a doubtful native, and the other *Cannabis sativa*, or Hemp, is certainly not so; yet, at the same time, they are both so well known from cultivation and uses, and their spread over our country has become so general, that at least they may be described as "naturalised" among us. Not only are the genera in this natural order so limited, but the number of species is equally so; and yet it would be difficult to point to a plant which possess greater interest, whether considered structurally, economically, or medicinally.

The Hop is well known as a common hedge-climber—indeed so common that Sir W. Hooker quotes Dr. Bromfield's opinion, who, he says, "thinks this indisputably indigenous in the south of England." But if this be so, the old adage which says that—

> "Hops, Carp, Pickernal, and Bere,
> Came into England all in one year,"

must apply to the introduction not of the plant, but probably of its use in brewing.

In as far as our observations in the field would lead us to decide this question, we are inclined to think that it has been introduced to our local flora, perhaps, first as an interesting and graceful garden plant, and then as an economic one.

Its constancy in hedge-rows near dwellings in districts

would seem to support this view, while the introduction of the hop as a crop plant seems determined by the fact that as the plant is diœcious, and the female plants yield the *strobiles*—which are the objects of cultivation. Male plants anywhere are exceedingly rare.

Though the Hop consists of a single species, yet, like all plants in cultivation, its recognised varieties are very numerous. As regards this point we quote the following from Morton's 'Cyclopædia of Agriculture:'—

"There are several varieties of hop now under cultivation in England; but we shall only enumerate those which are best known and most generally cultivated.

"The first in rank are the Farnham and Canterbury whilebines; these are so much alike, in every respect, that the appear to be the same variety.

"Secondly, the Goldings, which are little, if at all, inferior to the former; they are a stronger hop, but not quite so finely flavoured; and, when growing, they may be distinguished from the other two by the bine being somewhat larger, and the hops hanging more singly on the branches. The bines of these three sorts are speckled with reddish-brown spots. They all require the longest description of poles, varying, according to soil, from fourteen to twenty feet. The main roots of these varieties run more deeply into the soil than any other; and their plants are the most enduring upon the same land.

"Thirdly, the Grapes, of which there are several sub-divisions. These all grow in clusters like grapes, whence they derive the name. They differ much in quality, the smaller sorts being superior, some of which, when growing on good land, nearly approach to Goldings in value, while the larger descriptions, such as are usually cultivated in Sussex and the Weald of Kent, are coarse and very inferior in quality. The bines of the grapes are small, and of a light green colour. They require poles from ten to fifteen feet long.

"Fourthly, the Jones's, which will grow on lighter and inferior land, merely requiring refuse poles of eight or ten feet in length. The bine of this variety is red. The crop of the Jones's would be much increased if the top bines and branches were trained and interlaced from pole to pole.

"Fifthly, the Colegates, which are a very hardy variety, growing best upon stiff soils; they will run up a long pole, and are very late in ripening. The hop is small, and hangs from the branches in thick masses. It produces heavy crops, but it is not much esteemed by the brewer, and is more liable

to be injured by mould than the grapes. The colour of the bine is pale green, like the grape, but larger.

"Sixthly, the Flemish Red Bines, which grow on light siliceous soils; they very frequently escape the aphis or block-blight, hence they are commonly known by the name of 'Never-blocks.' They produce a poor, thin hop, and excepting from their favorable tendency to escape the aphis-blight, they can in no wise be recommended."

Now, with so many different sorts apparently adapted to such variable conditions, it is curious to note the few counties in which hop cultivation prevails, and still more so to consider the wide difference in their qualities at each distinctive district. Thus, the hops of Worcester and Hereford are as widely distinct from those of Kent as these are again from those of Surrey and Hants.

In the work before quoted it is stated that "speaking of the hop-growing districts in grand divisions, they thus rank: —1. Farnham; 2. East Kent; 3. Mid-Kent, West Kent, and the Hill grounds; 4. Weald of Kent and Sussex; 5. Worcester."

The geological formations forming the subsoils in the hop districts may be stated as follows. The best parts of the Cretaceous deposits, including the green sand, afford ground for the "hop gardens" in the three first divisions. The Wealden formation that of the fourth. In the fifth division the Worcester "hop yards" are situate on the New Red Sandstone, while the extension of hop growth into Herefordshire occurs in the Old Red Sandstone; and within the last few years the Worcester hop districts has extended into Gloucestershire, and here the subsoil is Lower Lias Shales.

There can be no doubt that the cultivation of hops is much confined to a certain composition of soil, for, as will be shown from analyses, that potash, magnesia, and phosphates are found to abound in the ashes of the hop plant, and these form a large per-centage of the best hop lands. The following calculation from Professor Way's analysis shows the—

Composition of the Ashes in pounds removed by an Acre of Hops.

	Hops.	Leaves.	Bines.
Silica	32·65	97·28	12·95
Chloride of sodium	1·26	13·58	3·40
„ potassium	15·26	9·96	19·90
Soda	—	—	—
Potash	54·01	57·15	22·81
Lime	16.33	133·98	30·99
Magnesia	8·17	21·06	4·88
Peroxide of iron	1·14	0.82	1·03
Sulphuric acid	8·69	8·22	3·02
Phosphoric acid	29·53	40·61	15·15
Carbonic acid	3·39	52·40	15·41
	170·43	435·06	129·54

Composition of Hop soils from Mid-Kent.

Insoluble silicious matter	32·81
Soluble silica	29·14
Organic matter	3·02
Potash	3·10
Lime	9·53
Magnesia	1·97
Oxide of iron and Alumina	11·46
Phosphoric acid	6·61
Carbonic acid	2·30
	99·94

Professor Way further states that a mass of rock from Kent broken up gave—

Insoluble silicious matter	30·60
Phosphoric acid	7·23
Potash	3·31
Soda	1·02

These facts seem to show that there is an intimate connection between the crop and the soil, but the limitation of hop cultivation is not entirely dependant upon this cause, as it must be remembered that the growing of hops is quite a local business—both the farmers and their men have been brought up to the business, and therefore however suitable soil may be for hops, if far removed from what may be termed hop centres, it would be difficult to establish hop gardens in them—unless by the migration of hop planters, a matter not easily brought about. Were this so, we should be inclined to think that as even the Chalk and Green Sands extend into Dorset, if these deposits were necessary to the hop, no county would be more suitable, though we are not prepared to say whether the prevailing moist atmosphere of this "county of the mist" would be to its advantage or otherwise,

though wild hops are most luxuriant both on the cretaceous and oolitic deposits of the county.

Some years since, having had hopbine sent from Worcestershire, we were astonished at the quantity of magnesia contained in its ashes, and we then recommended that sulphate of magnesia (epsom salts) should form part of artificial manures for hops; and some experiments with this salt, mixed with super-phosphate, convinced us that hops, like other crops, can be manured for as our trials were made in the cold climate of the Cotteswolds, and on a soil so ungenial as the Forest Marble.

The Uses of the Hop.—The value of the strobiles of the hop for which the plant is cultivated is now so fully recognised, especially by the drinker of our national beverage, that instead of beer, as formerly, being called "malt," it may almost be named "hop liquor," the prevailing taste running upon "bitter beers."

As a medicinal agent much difference of opinion exists as to the value of Hops; by which term is here meant merely the fruits of the plant, of which the following is the description by Dr. Pereira:—

"The aggregate fruits of the *Humulus Lupulus* are strobiles or catkins (*strobili* seu *Amenta lupuli*), in commerce termed Hops. They consist of scales, nuts, and lupulinic glands or grains. The *scales* are the enlarged and persistent bracts, which enclose the nuts; they are ovate, membranous, and at their base glandular. The *nuts* (achenia) are small, hard, and nearly globular, and covered with aromatic, superficial, globose glands. The *lupulinic glands* or *grains* (commonly termed *yellow powder* or *lupulin*) are the most important part of the strobiles. By thrashing, rubbing, and sifting, Dr. Ives procured fourteen ounces from six pounds of hops; and he therefore concluded that dry hops would yield about a sixth part of their weight of these grains."

The following is an analysis of lupulinic grains:—

*Lupulinic grains by Payen, Chevallier, and Pellatan.**

Volatile oil	2·00
Bitter principle (Lupulite)	10·30
Resin	52 to 55·00
Lignin	32·00
Fatty, astringent, and gummy matters, osmazone, malic and carbonic acid, several salts (malate of lime, acetate of ammonia, chloride of potassium, sulphate of potash), &c.	Traces.
	99·30

* 'Journ. de Pharm.,' t. viii, p. 209.

Notwithstanding some difference of opinion, the narcotic effects of Hops seem to be well established, which need not surprise us, when we know that a plant of the same order—Hemp—is so highly narcotic. The soporific qualities of beer are to a great extent attributable to the hops which enter into its composition.

Hop pillows are used to produce sleep; and Pereira states that "the benefit said to have been obtained from it by George III, for whom it was prescribed by Dr. Willis, in 1787, brought it into more general use."

The pharmacopœias retain several preparations of Hops, as Infusum lupuli, L., Tinctura lupuli, L., Extractum lupuli, L. E., Tinctura lupinæ, D., but it is seldom used in these forms. In the shape of bitter beer it is constantly recommended by medical men in different states of the system, whilst in others nothing is so sternly interdicted as beer in any form.

The Common Hemp.

Cannabis sativa is the plant which gives the name to the natural order. It is sometimes cultivated by us for the sake of its fibre and its seeds—the former being made into cordage, and the latter as food for small birds. Like the hop, hemp is diœcious, its male plants being ripe before the female or seeding one, and hence it is best to be harvested separately.

Morton gives the cost of cultivating a crop of hemp, including rent and taxes, as £18 7*s.* 6*d.*, and the products as worth £19, a state of things which will be an effectual bar to any extended growth of this crop with us. It is, too, highly exhaustive, as it absolutely takes all from the soil, and leaves no manurial matter on the farm.

Medicinal Uses.—There can be but little doubt that in Hemp we have a powerful remedial agent. The effects of *gunjah* and *bang*, Indian, and *hashish*, Arab preparations from Hemp, are well known. Dr. O'Shaughnessay, who seems to have written exhaustively on Indian Hemp, ascribes to it *anæsthetic*, *cinetic*, and *cataleptic* properties, but Dr. Pereira says:—

"On Europeans I have never heard of a cataleptic state being produced by this drug. In the case of tetanus under my care in the London Hospital, and which was carefully watched by Dr. O'Shaughnessey and myself, the resinous extract of Indian Hemp was given in increasing doses up to twenty grains. It caused stupor and cessation of spasms, but no perfect cataleptic state. The only tendency to this condition which was observed was when the arm of the patient

was lifted and then cautiously let go; it fell slowly and gradually, not quickly, as it would have done under ordinary conditions. The patient was at the time quite insensible."

Dr. Hooke informs me that its effects on *animals* were analogous (to those on man). He gave ten grains of Nipalese Churrus dissolved in spirit to a middling-sized dog. "In half an hour he became stupid and sleepy, dozing at intervals, starting up, wagging his tail as if extremely contented; he ate some food greedily. On being called to, he staggered to and fro, and his face assumed a look of utter and hopeless drunkenness. These symptoms lasted about two hours, and then gradually passed away. In six hours he was perfectly well and lively."

Neither Hops nor Hemp have a place in the Veterinary Pharmacopœia, but were we of the profession we know of no plants that we should be so anxious to test their effects upon the lower animals. We have seen wonderful quieting influences both upon horses and cattle from the exhibition of a quart of beer, more than we think can be fairly attributable to the small amount of alcohol it may contain; and the effects of Hemp upon man and the lower animals are just those that are often so desirous to produce, and on this account we think the plant deserving more notice than it has yet received at the hands of the veterinary practitioner.

CASE OF LACERATION OF VAGINA AND RECTUM OF A MARE IN THE ACT OF PARTURITION.

By R. Hudson, M.R.C.V.S., Retford.

The following is a short history of a case of parturition which Professor Simonds had the kindness to give my son advice upon in April last, and being a very unusual case, perhaps it may be deemed worth recording.

On the night of the 27th March I was called out of bed to attend a five-year-old draught mare, belonging to Mr. Creighton, Ordsall, near Retford, in consequence of protracted parturition, it being her first foal. On arrival I found that the persons in attendance had taken the foal away; and that during labour the head and neck of the foal had protruded from the anus of the mare, to an extent as to reach nearly as far downwards as her hocks. On further inquiry I

was informed by the horseman that on first entering the stable he found one foot of the foal protruding from the vagina, and that in consequence of this state of things he called the shepherd to his assistance. His account was as follows:—"I found the other foot propping and pointing upwards towards the spine, and after pulling it downwards into position, the next pain sent the head into the place which the foot had previously occupied, and a second pain forced the head through the passage and out at the anus." The foal was alive, but to effect delivery the head was cut off, which enabled them to push back the neck into the vagina, and accomplish delivery.

The mare looked anxious and unsettled. Her head was held high up, and she was paddling with the hind legs, and whisking the tail occasionally. The pulse and respiration were both somewhat quickened. On an examination being made *per vaginam*, I was enabled to pass my hand through a large rent, and to touch the forefinger of the other hand, which I had passed into the rectum. The edge of the lesion in the rectum was nearly the length of the finger from the outlet. An anodyne and aperient ball was given, and the mare moved quietly away from among the other horses to a loose box. The parts were well fomented, and anointed with lard, the only thing at hand. Directions were left to repeat the fomentation if the uneasiness did not soon subside, and also to carefully remove any accumulation of fæces which might take place.

28th.—I found the mare with her tail up, and straining, that is, making ineffectual efforts to evacuate her fæces. On examining the rectum a quantity of dung was found wedged in it, the removal of which evidently gave relief. A clyster pipe was passed just within the anus, and warm water poured down the tube with a pitcher until the rectum was thoroughly cleansed. The injured parts were then dressed with Tinct. Myrrh. Co. and Ol. Olivæ, and a small lump of lard was placed in the rectum to lubricate the parts and help the passage of the fæcal matters. The pulse and respiration were tolerably quiet, and the mare would eat all which was allowed her.

29th, 10 p.m.—A messenger came to say the mare was worse in her breathing, and so very stiff in the hind quarters that she could not move. On arrival I found the stiffness and difficulty was more in the fore extremities, and that metastasis of morbid action to the fore feet had taken place, but was not particularly severe. Pulse 60, and full. Aloes ʒiv c. Hydr. Chlor. ʒj were given with a fever draught, and

wet bandages applied around the feet. The rectum was emptied and cleansed as before, and directions left to introduce the enema tube and cleanse the parts twice a day. Sloppy mashes were ordered to be continued.

30th.—Early this morning the shoes were taken off, and the edge of the crust well rasped away, leaving the sole and frog untouched. The rectum was not found so full of fæces; indeed, slight purgation had commenced. A powder, consisting of Hyd. Chlor. ʒj, Resinæ Pv. ʒij, was given in a mash.

31st.—Fore feet somewhat relieved. The mare moves better and more naturally. The hind legs are not placed so far under the body. The rectum is empty of all fæces, but a small quantity of feculent matter passed through the lesion and lodged in the vagina.

April 1st.—Slightly improved; the fæces are soft, and come away more in the usual quantity. A piece of dead tissue is hanging out of the vagina, which I deemed right not to interfere with. A good deal of discharge has also now made its appearance.

3rd.—A laxative ball was given, and wet bandages continued to the feet. From this time the mare went on well.

On the 9th the bandages were discontinued, the lameness having nearly passed off. Some buttons of fæcal matter still drop into the vagina, and this seems now the only inconvenience. The rent in the rectum has contracted considerably, and seems to be partly arched over by a portion of the lining membrane projecting from the antero-inferior part of the rent. Posteriorly, the edge of the lesion feels now only just within the anus, but there is not the slightest indication of union by healing.

16th.—The shoes were set on, and the mare ordered to have a little exercise.

27th.—Has had light work for two or three days, and today a full yoke, which has somewhat overdone her, but to night she is feeding, and has gone regular to work since.

Now a remark as to the probable cause of the lesion of the vagina. I could not learn from the shepherd (who is a good and careful man) how the foal was really presented, but it must have been placed more or less on its back. He said, however, that the mare's throes were fearfully strong. Whether in moving the foot and pulling it downwards some injury was first done, can only be conjecture.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of April, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Foot-and-mouth	...	6	...	....	6	6
Boulogne .	„	„	...	45	...	...	45	45
Bremen .	Hull . .	„	...	4	...	...	4	4
„	London .	„	302	...	...	...	302	302
Bremerhafen .	Leith . .	„	...	6	...	...	6	6
Cophenhagen .	Hull . .	„	...	2	...	...	2	2
Coruña .	Portsmth..	„	4	...	...	...	4	4
Dantzic .	Hull . .	„	...	3	...	...	3	3
Dunkirk .	London .	„	...	26	...	...	26	26
Hamburg .	Grimsby .	„	...	5	...	...	5	5
„	Hartlepool	„	26	...	...	...	26	26
„	Hull . .	„	101	106	...	...	207	207
„	London .	„	57	...	...	...	57	57
„	Middlesborough	„	6	1	...	...	7	7
„	Newcastle-on-Tyne	„	5	137	...	...	142	142
Rotterdam	„	„	1	...	...	...	1	1
Total . .		Foot-and-Mouth	502	341	...	...	843	843

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 13th May, 1872."

CATTLE PLAGUE.

In France the "bovine pest" bids fair to become a chronic affliction. Month by month we have to record the existence of the disease, with but little alteration of details.

We learn from the *Journal Officiel* that a discussion took place in the latter part of April, in the National Assembly, respecting the continued prevalence of the plague in the Departments Nord and Somme, and it seem to have transpired, in the course of the debate, that some delay had taken place in the payment of compensation for animals slaughtered by order of the authorities; consequent on this neglect the farmers became apprehensive of losing beasts and money, and accordingly did their best to conceal outbreaks of disease on their farms, in order that they might submit the sick animals to treatment, in the hope of saving some of them, while they sold the cattle which had been in contact with diseased ones to those dealers who, in all countries, appear to be ready to buy without asking any questions. In this manner, it is alleged, the disease was carried to seven communes in the north simultaneously.

In our report last month we stated that seven communes in the Département du Nord were infected; the number has now increased to twelve, and this in spite of the measures of repression which have been adopted—measures which, we took occasion to remark, did not accord with the English notion of "energetic."

Belgium continues to enjoy an immunity which, under the circumstances, is remarkable, and which is only secured by constant watchfulness. The *Journal Agricole du Brabant* every week denounces, in strong terms, the apathy which prevails across the frontier.

Russian Poland is reported to be free from rinderpest, and in consequence of the cessation of the disease the *Official Gazette* of East and West Prussia has announced that the prohibition of the imports of cattle and certain other articles of commerce from those provinces is rescinded. The exemption, however, it is distinctly stated, does not extend to Steppe cattle.

PLEURO-PNEUMONIA.

Holland has suffered rather severely from this malady during the spring. In four weeks, up to the middle of April,

between four and five hundred cases of the disease were reported to have occurred in different parts of the kingdom, principally among stalled animals.

The measures adopted to arrest the progress of the disease are very stringent. All diseased animals are slaughtered, and those which have been herded with them are inoculated and isolated. If the owner objects to inoculation, he is compelled to keep his cattle from association with others for a long period, under the observation of the authorities. In this country there has been no important change in the state of prevalence of the disease since the last report.

FOOT-AND-MOUTH DISEASE.

This affection still prevails in Hamburgh and its vicinity, and diseased animals have been landed in this country during the last month from Antwerp, Boulogne, Bremen, Bremhofer, Copenhagen, Corunna, Dantzic, Dunkirk, Hamburgh, and Rotterdam.

Fresh outbreaks have occurred in Norfolk, Kent, Cumberland, and some parts of Scotland.

Facts and Observations.

The Metropolitan Cattle Market. — From the account furnished by the Chamberlain of London to the Corporation in relation to the Metropolitan Cattle Market, it appeared that during the past year the receipts amounted to £31,089, and included the following items among others, viz., lairage dues, £13,519; tolls on beasts, sheep, calves, horses, and pigs, £3754; dues for pens and rails, £8019; rents, £3371; reimbursements from tenants for gas and water consumed, £373; and rents of neighbouring improved dwellings for labouring poor, £1141. A loan of £35,000 was raised, and there was a balance of £8131. The payments included £20,418 as interests on loans and mortgages, £8131 for forage, £2237 for repairs, and £3372 for salaries and wages, £2356 for rent, taxes, and insurance, £973 for gas and water, £619 the expenses of the improved dwellings, and £35,000, being the amount of a loan discharged. The moneys owing by the Corporation upon the market, and secured on its revenue and bonds, were £443,000. —*Echo.*

Absorption of Insoluble Matter.—The *Philadelphia Medical Times* published an abstract, by Dr. Louis A. Duhring, of a series of experiments made by Dr. Auspitz, of Vienna, on the absorption of insoluble matter in mammals. The following are the conclusions arrived at:—1. That, in mammals, insoluble matter (starch-flour granules), starting from the peritoneum and subcutaneous tissue, is able to reach the lungs, and through these organs to enter the general circulation. 2. That these granules, in order to go over into the veins, pass through the lymphatic system. (That they are taken up exclusively in this way is not as yet proved.) 3. That the epidermis always presents a considerable, though only relative and not absolute, obstruction to the absorption from the integumentary surface. 4. That the absorption is essentially promoted by the mediation of fat, which goes over into the circulation in the same manner as starch-flour, though even more easily. Finally, the supposition may be offered, even if the direct proof is provisionally deficient, that all that is true of starch-flour, and in a higher degree of fat, may also be asserted of other insoluble bodies of finer division and, therefore, less permanence of form than the starch-flour. The supposition is not in any way contradicted by the discoveries of Auspitz, made in connection with his well-known inunction experiments with mercury.—*Edinburgh Medical Journal.*

Analyses of Food-stuffs.—The food-stuffs analysed were principally average samples of the hay and oats used in eight first-class studs in Austrian Hungary; of these samples the mean composition is given below, also the highest and lowest percentages found. The forest-hay is obtained from the Alpine regions; it is rich in aromatic herbs, and is highly valued.

Food Stuff.	Water.	Protein.	Crude fat.	Crude fibre	Non-nitrogenous extractive matter.	Ash, (minus C, CO_2, and sand).	Potash.	Phosphoric acid
Hay, highest percentages...	14·45	14·43	6·69	33·33	40·12	7·86	2·51	·61
Hay, lowest percentages ...	11·30	10·48	3·74	21·18	29·99	5·38	1·55	·35
Hay, mean of eight samples	13·13	12·57	4·86	28·59	34·36	6·48	1·98	·43
Forest hay	14·56	14·34	4·69	29·23	30·70	6·48	—	—
Oats, highest percentages...	14·42	18·51	7·11	13·39	56·24	4·84	·70	·91
Oats, lowest percentages...	11·27	10·10	5·72	9·81	47·96	3·08	·38	·68
Oats, mean of ten samples .	12·76	14·08	6·45	11·24	51·84	3·62	·55	·78
Potato refuse (spirit factory)	96·05	·79	·23	1·40	1·12	·41	—	—
Iceland moss	15·04	4·47	5·79	1·49	72·03	1·19	—	—

—*Journal of the Chemical Society.*

THE VETERINARIAN, JUNE 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

"THE NEW MOVEMENT AT THE ROYAL VETERINARY COLLEGE."

IT is satisfactory to observe that the medical and agricultural press have recently assisted in giving publicity to the new arrangements which have been carried into effect at the Royal Veterinary College. The *Field* of May 11th has the following:

"ROYAL VETERINARY COLLEGE.—The Governors of the College at their last meeting resolved that for the future the educational year shall be divided into two sessions, a summer session, commencing May 1st, and terminating June 30th, and the winter session, as hitherto, extending from October to the end of March. The first summer session was opened on Wednesday last, and Dr. Spencer Cobbold gave an opening address to a large class. In the course of his lecture Dr. Cobbold pointed out the great importance of a comprehensive knowledge of science, and recommended the students not to be discouraged by the difficulties which always beset the beginner. The lecturer concluded by announcing his intention to treat his subject (botany) practically, and proposed for this purpose to alternate his lectures with field excursions in the neighbourhood. At the termination of the address the Principal, Professor Simonds, informed the class that the subjects of anatomy, pathology, therapeutics, and pharmacy, with the usual work in the laboratory, dissecting room, and infirmary, would constitute the course of study for the summer term."

From the *Agricultural Gazette* of May 4th we extract the following paragraph:

"The summer session of the Royal Veterinary College was inaugurated on Wednesday last by the delivery of an introductory address by Dr. Spencer Cobbold, who has been appointed by the Governors of the College to deliver a course of lectures on botany, with especial reference to those plants which possess medicinal or dietetic properties. Dr. Cobbold

in his address took a comprehensive view of the whole range of human knowledge, and pointed out the relations which exist between the different divisions of science. A large class was in attendance; and everything promised well for the success of the new system of dividing the educational year into two portions instead of, as hitherto, leaving a long period of unoccupied time at the disposal of the students."

The *British Medical Journal*, in commenting on the "New Movement at the Royal Veterinary College," says:

"The Governors of this College, sensible of the deficiencies of their institution, are at length making a sincere effort to raise the standard of professional education in the department of medical science which they represent. It is almost unnecessary for us to state that we sympathise with the movement; the more so, since the veterinary calling stands at a much higher level in France and Germany than it does with ourselves. The governors have elected Mr. Brown, V.S., to the chair of general and comparative physiology; and they have secured the services of Dr. Cobbold, F.R.S., for the delivery of a summer course of medical botany. Mr. Brown was formerly attached to the Cirencester College, and by common consent holds a high place in his profession. The summer term (in itself a novelty) was opened on May 1st by Principal Simonds, the inaugural discourse being delivered by the lecturer on botany. Mr. Brown gave his introductory address on the following day, the whole staff of the College being present on both occasions. On Friday, the 3rd instant, Dr. Cobbold met his class, about seventy in number, on Hampstead Heath, when a large number of wild plants were gathered and described. He also took occasion to point out the geological features of the neighbourhood, and the causes concerned in the formation of the Thames Valley. Various pond snails were likewise collected, for the purpose of explaining to the students the nature of the parasites which live in them, and the genetic relations subsisting between these larval entozoa and the flukes that give rise to the 'rot' or liver disease of the sheep. Mr. Tuson, F.C.S., Mr. Axe, Mr. Grindrod, of St. Mary's Hospital, and other gentlemen, lent their support on the occasion. On Monday the examiners, office-bearers, and members of the College, dined together at the London Tavern; the Scotch schools being represented on the occasion by Principal Williams, of the Edinburgh Veterinary College."

We have referred more than once to the subject of the

summer session, and we do not scruple to return to it, because we do not doubt that every member of the veterinary profession will be interested to know how far the experiment, as it may be called, has answered the expectation of those who are pledged to conduct it.

We are glad to be able to state that there is no reason to apprehend any failure. All the elements of success, and not the least of them, a large and attentive class, are present.

The students have been prepared to expect that something more than the mere act of sitting through an hour's lecture will be exacted of them, and they are not indisposed to perform their due share in the work of improvement.

While every encouragement is offered to the persevering, no attempt has been made to conceal the magnitude of the work which lies before them.

Dr. Cobbold in his opening address took a cursory but comprehensive glance at science as a whole, showing the connection which exists between every and all the phases of human knowledge. His remarks were happily illustrated by a diagram representing the universe under the formula of the initial letter of *Cosmos;* he touched in rapid succession on the organic and inorganic kingdoms of nature. These, again, were divided into (organic) animal and vegetable worlds, and (inorganic) mineral, aqueous, and aërial, represented by the sciences of mineralogy, hydrostatics, and pneumatics. Then by a synthetical process the lecturer proceeded to condense all the various forms of knowledge into the two sciences of biology and abiology, the science of living and the science of dead things.

On the grand stand-point of the universe the lecturer invited the students to rest and survey the whole subject of human knowledge without fear. The difficulties which bar the student's progress, he remarked, are chiefly imaginary, and disappear in the face of resolute endeavour. Giving all honour to birth and position, he nevertheless contended that the real difference between one man and another is due to the effects of cultivation on his mental processes.

The work of the summer session is now in a state of full activity, and if we may judge from the demeanour of the

students, the "new movement" is highly appreciated by them. With the exception of two or three rejected students, the whole class is in attendance, and every department of the curriculum attracts its complement of assiduous workers. In fine, the success of the scheme is assured, so far as success is possible under the present arrangements.

We repeat, present arrangements, because we hope yet to see the "class system" more perfectly carried out. The union of first and second session men is objectionable; the one is puzzled by a multiplicity of unaccustomed subjects, which are forced on his attention all at once; and the other has to endure the repetition of all of them in the succeeding terms, whether he has mastered any one of them or not.

Division of labour, mental or physical, is essential to the perfect performance of work; therefore we hold that a decided effort should be made to introduce the class system, at least to the extent which we have suggested. Not without hesitation do we press for further reforms at our Alma Mater, because we are quite aware that we may be met by the response that enough has been done for the present; our point is, however, that nothing has been done in the last few weeks which might not have been achieved more than twenty years ago, and in saying this we only echo an oft-repeated remark of the members of our profession. A quarter of a century of stagnation has left an amount of infertile sediment which will require a great deal of stirring before it can be fairly cleared away, and with the knowledge of the necessity before us we may be pardoned for impressing on the authorities the importance of action. The happy phrase "rest and be thankful" may be rightly adopted by the politician who sees no room for reform in the future, but it can never be accepted by men of science, and for the veterinary colleges there is too much to be done to permit even a dream of rest, while too much has been left undone to justify any present expression of thankfulness.

Extracts from British and Foreign Journals.

RESULTS OF EXPERIMENTS ON PYÆMIA.

Dr. Burdon Sanderson delivered an address on this subject. He began by relating his first experiments as to the effect of inoculating the lower animals with pyæmic liquids. In the autumn of 1867 he injected the purulent liquid contained in the ankle-joint of a patient, who had died a few hours before with metastatic abscesses, general suppurative arthritis, and intense septicæmia, under the skin in a dog and two guinea-pigs. The two guinea-pigs died within short periods (fifteen and twenty days), and exhibited symptoms of great intensity. Both had metastatic abscesses; but in one the lungs were already beset with minute nodules, resembling miliary tubercles. The dog lived seven weeks. In this case there were no secondary abscesses, but miliary tubercles of the liver and spleen. From one of the guinea-pigs, two others were inoculated, of which one died of pyæmic subcutaneous abscesses, without visceral disease; the other, which lived longer, had no abscesses, but tuberculous disease of the lungs. During the same winter, other experiments of the same kind were made, all of which seemed to show that, by the inoculation of pyæmic products, two sets of lesions might be produced: as an immediate result, metastatic abscesses, accompanied by a general typhoid state, which was often fatal; as an ulterior result, either disseminated nodules, at first hard, but afterwards becoming caseous at their centres, or interstitial induration—both forms of lesion having their seat chiefly in the lungs, spleen, and liver, but also occurring in other viscera.

Having stated these facts, which he said had even in 1868 led him to regard it as probable that the two forms of infective lesions—the tuberculous and the pyæmic—were connected together etiologically and genetically, he referred to another fact which resulted from experiments made in 1871, as to the existence of bacteria in animal liquids, and the circumstances which determined their occurrence. These experiments had shown that, whereas bacteria could not be shown to be present either actually or in germ in the healthy liquids or tissues, or in the products of healthy inflammation, they were present potentially in pyæmic liquids—that is to say, that, whereas ordinary pus could be kept for days or even weeks free from bacteria, provided the precautions against

"spontaneous generation" were observed, pyæmic pus could not be so kept, and, moreover, possessed the properties of at once determining the development of bacteria in any suitable liquid to which it was added. At that time he had concluded, as he now knew, from insufficient observation, that pyæmic pus did not itself contain visible bacteria.

A short account was next given of certain researches made during last summer, in association with Dr. Klein, as to channels by which infective poisons were distributed from their centres of origin. Referring to the last occasion on which he had brought the subject of the intimate pathology of tubercle before the Society, and to the doctrine he had then advocated, that tuberculosis is an irritative overgrowth of a pre-existing tissue, he said it had then been shown that the process, in its disseminated or interstitial form, had its seat in a certain tissue, and this tissue had been termed adenoid or lymphatic—both words implying its intimate and special relation with the lymphatic system; but the precise anatomical nature of this relation had been imperfectly made out. No further progress was made till last May, when Dr. Klein came to England with the distinct object before him of co-operating in the investigation of this very question. The field taken up was the peritoneum; the reason of the choice being, that that membrane, and especially the omentum and diaphragm, had already been the subject of investigation, as favourite seats of tuberculosis. Those researches had not merely served to elucidate one or two anatomical facts of very great importance to the pathologist—*e. g.* the existence of a lymphatic system in the omentum and its distribution, and the mode in which the peritoneum communicates with the lymphatic system—but had rendered it possible to give an account which, so far as the peritoneum was concerned, was tolerably exact and complete, both of the normal process of absorption and of the changes which the absorbing tissues undergo when they are entered by infective agents.

In the course of these experiments it was found that not only as regarded the property of any given peritonitis to assume the infective character, but as regarded the intensity of the infective results and their duration, there were endless varieties. In one set of cases, the secondary lesions were suppurative, the constitutional disturbance intense, and the fatal result rapid; in another, the lesions were vascular new growths, firm at first, afterwards becoming caseous, the progress slow, and the functional disturbance imperceptible. And then it appeared that in all those instances in which the pyæmia—*i. e.* the acute character—manifested itself, bacteria

were preent, not merely in the purulent liquids, but in the blood. Under these circumstances, attention was directed from the effects to the poison itself. Soon after the opening of the Brown Institution, it was found that the practice of the hospital for animals was likely to afford the required material; in short, that pyæmia occurred in dogs under circumstances very similar to those which determined it in human beings, and exhibited similar symptomatical and pathological aspects. A series of experiments were therefore commenced in January last, having for their object to acquire a knowledge of the morbid poison, and particularly to discover by what conditions the variations of its intensity were governed.

With reference to these experiments, Dr. Sanderson would not anticipate the complete account of them in the Report of the Medical Officers of the Privy Council, but would confine himself to giving an account of one series, and exhibiting the action of the pyæmic poison during life, and the *post-mortem* appearances; but before doing so, he would state shortly what he understood to be the signification of the term pyæmia. He then proceeded to say:

"The word pyæmia is apt to be used in somewhat different senses, according as the person using it has before him the medical or surgical aspect of the disease. To define it completely we must, I think, take into account its mode of origin, its symptoms, and the anatomical changes which it produces; not confining our attention to either of these to the exclusion of the rest. With this consideration in view I would comprehend in my definition the following propositions:

"1. Pyæmia originates by the introduction into the living tissues, and eventually into the blood, of a *poison* which is itself a *product of inflammation*.

"2. The action of this poison manifests itself in an alteration of the blood, and in disorder of the vital functions. The former of these is characterised by the presence of bacteria, and by change in the optical characters of the blood, which often becomes obviously more transparent and darker by reflected light than it is naturally. Of the latter, viz. the general disorder of the vital functions, the most prominent phenomenon is fever, which, in the more intense forms of the affection, is followed by collapse which culminates in death.

"3. More remotely, the disease manifests itself in secondary suppurations, *i. e.* in the formation of metastatic abscesses, which may occur either in the internal organs or underneath the skin. The special character of these metastatic (as I am in the habit of calling them) infective abscesses

are those which are well known both to surgeons and physicians. They have the additional less known character, that the pus they contain is full of bacteria.

"Pyæmia *differs* from tuberculosis in the rapidity of its progress, and in the obvious character of the anatomical changes of which it consists. Whereas by tuberculosis we are understood to mean anatomically the overgrowth of cells in certain tissues, which we designate lymphatic on account of their proved anatomical relation to the lymphatic system, the secondary inflammations of pyæmia result in the formation of infective abscesses.

"Pyæmia resembles tuberculosis in its mode of origin. Both spring from inflammations; and, so far as relates to the anatomical characters of the lesions, both are inflammations. To both, therefore, the term secondary or infective inflammation is applicable.

"So much for the disease itself. Let me now," said Dr. Sanderson, "draw your attention to the nature of the poison. I wish to show (1) that every pyæmic abscess contains a poison, which, when introduced either into the circulation or into a serous cavity, produces the symptoms of pyæmia; and (2) that we have this poison so entirely in our possession, and so far under control, that, beginning with an agent so mild in its action that it produces no marked symptoms, we can convert it into an agent of such intensity that it kills in two or three hours with the formidable symptoms seen in the case we have now before us.

"This intensification is effected by a process which may be called cultivation. Dr. Klein made the important discovery that, if a pyæmic liquid were transferred to the peritoneum of a guinea-pig and allowed to remain there for a couple of days, although it did not at first produce any intense symptoms in the animal itself, its toxic intensity increased in such a degree that, when the transudation-liquid produced in this was injected into another animal, it had acquired the most deadly activity; and that all such extremely active liquids were crowded with bacteria of a particular character, the increased number of which seemed to be in proportion to their toxic properties."

Dr. Sanderson then proceeded to exhibit a dog, into the abdominal cavity of which six drops of a pyæmic transudation-liquid had been injected three hours before. The animal was in a state of profound collapse, accompanied with vomiting, purging, and cramps of the extremities. Shortly afterwards, the animal was killed and the abdominal cavity opened. The peritoneum contained liquid slightly stained with blood,

which, on microscopical examination, was found to be crowded with bacteria. The intestines were distended with a frothy liquid, which possessed none of the characters of the natural contents which had been found in other cases to be charged with shed epithelium. The internal surface of the whole of the alimentary canal from the stomach downwards was intensely infected, and presented appearances which (as had been found by more careful investigation in previous cases) were due to the separation of the epithelium from the surface of the mucous membrane, and the infiltration of that tissue with liquid.

The material which produced these results was obtained as follows. Pus from a pyæmic abscess of spontaneous, *i. e.* accidental, origin was introduced into the peritoneal cavity of a guinea-pig and allowed to remain there for two days. It was then withdrawn from the guinea-pig, and some of it at once injected into the peritoneum of a dog. The dog was affected in exactly the same way as the animal exhibited to the Society. The remainder of the liquid was kept for five weeks in hermetically sealed tubes, after which six drops were injected into the peritoneum of a guinea-pig; this showed its action to have become relatively feeble. After two days, the transudation-liquid produced was (on the day before the meeting) tested with a third guinea-pig and found to be extremely active. This afternoon it was injected into the peritoneum of the dog exhibited.

Dr. Sanderson then concluded by saying—"Such are the facts. The all-important question remains—Do these experiments concern us as physicians and surgeons, or not? I think they do. But what I want is to prove it; for I am well aware that, unless clinical observation come in aid of pathological experiment, the results of the latter do not tell practically. Let me state what are the lines of inquiry which I desire to see taken up. The first question is—Do the characters which we have shown to be present in the products of acute secondary inflammation in the lower animals, also exist in similar products in man? The second is more important still—Can it be shown that human pyæmic products, when tested by inoculation, possess exactly the same morbific properties as those which are possessed by the liquids to which our experiments relate? It is for answers to these inquiries that I earnestly ask the assistance of hospital surgeons.

"Finally, I would say a word as to the limits of the question now before us. With regard particularly to the question of bacteria, I desire to keep to the bare facts of disease, and not

to diverge into discussions as to their origin. It is a matter to me of comparative indifference how they originate. Our observations lead us to conclude, first, that they afford a *characteristic* by which we may distinguish the products of infective inflammations from those which are not infective, and that their number affords an indication of the degree of infectiveness; and, secondly, that their presence in the blood is an indication of that constitutional disturbance which accompanies infective inflammation; not merely when that disturbance assumes the degree of intensity of which we have an example before us, but in the slighter form of irritative fever. If these facts prove to be true, not only in the lower animals but in man, their importance is quite unaffected by any theory which we may entertain as to the origin of bacteria."

THE FOOT AND MOUTH DISEASE IN AUSTRALIA.

A MEETING of stockowners and others, convened by the council of the National Agricultural Society, was held January 23rd, at Menzies' Hotel, Melbourne, for the purpose of considering what steps should be adopted to prevent the introduction of the foot and mouth disease into the colony. There were about fifty persons present. Mr. Samuel Wilson was called to the chair.

Mr. D. Munro, secretary to the National Agricultural Society, explained that the council of the society had called the meeting in consequence of a letter received from Mr. Graham Mitchell, M.R.C.V.S., who had drawn attention to the fact that at a meeting of stockowners, held recently at Sydney, the following resolution had been adopted:—"That the Government be urged to enforce clause 10 of the Imported Stock Act 1871, by prohibiting the importation to this colony of all animals liable to foot and mouth disease so long as that disease is known to exist in Europe." A letter had also been received from the secretary of the New South Wales Agricultural Society, forwarding a copy of resolutions adopted at a meeting of stockowners, held at Singleton, N.S.W., on the 12th January, to the same effect, and inviting the co-operation of the Victorian society in taking action in the matter.

The Chairman remarked that this was a very important matter. It was very desirable that the food consumed by the people should be of a wholesome character, and it had been stated in the papers that the disease attacked the human subject from the use of the milk of cattle affected by the disease. Cattle, and even sheep, he thought, should be prohibited from entering the colony, or be introduced only under the most stringent quarantine regulations. There were at present in the colony plenty of as good sheep and cattle as could be found in any part of the world, so that there was no necessity for bringing in fresh stock from without. He thought the

meeting should pass resolutions calling upon the Government to adopt measures to prevent the introduction of foreign stock for some time to come.

Mr. Graham Mitchell said that the fact of diseased cattle having been carried by ships arriving at Sydney on several occasions during the last twelve months, several of the animals having died on the voyage, and others having been placed in quarantine, was a repeated warning not to be lost sight of by the stockowners of Victoria. From the *Veterinarian* and English agricultural journals it was found that terrible havoc had occurred amongst cattle, sheep, pigs, &c., from foot and mouth disease and pleuro-pneumonia. Foot and mouth disease had been known in England since 1839, but within the last two years it had assumed a more virulent form than previously known. The measures proposed by the meeting of stockowners of New South Wales would be tantamount to the total prohibition of importing stock. Quarantine regulations, however, similar to those in force in England, which applied to all the contagious diseases of animals at home and abroad, would, he presumed, answer the purpose in view. Foot and mouth disease affected the mucous membrane of the mouth, stomach, and intestines, and the delicate and finer portions of the skin between and around the hoofs, and in the udder in cows giving milk. In fully developed cases portions of the coverings of the tongue fell off, leaving the organ highly inflamed and intensely sensitive and painful. Ulcers were found in the intestinal mucous membrane, and diarrhœa was generally present. The distinctive symptoms were dribbling of saliva from the mouth, smacking of the lips, bloodshot and watery eyes, lameness, arching of the back, and disinclination to move. He trusted that stockowners would be alive to the danger that now threatened. Hitherto they had always shut their eyes to the warnings of the veterinary surgeons and the press, as in the matter of pleuro-pneumonia, but it would be insanity to suppose that when this foot and mouth disease was so rife in England, America, and India, there was no danger of its being established here. Total prohibition of the importation of stock would not do, but a three months' quarantine might be insisted on.

In reply to Mr. Kirk,

Mr. Mitchell said he had seen the disease in sheep as well as cattle. Sheep, he considered, were as much liable to it as cattle. The fever ran its course in about ten days, and vesicles formed about the mouth, and there was lameness, suppuration of the joints, &c. The disease attacked every animal without exception, and children had been known to take it from drinking the milk of diseased cows.

Mr. Robert M'Dougall said he was in England a year and a half ago, and while there he paid particular attention to all matters relating to cattle. Foot and mouth disease was very prevalent amongst cattle, and he had every opportunity of observing its action. He was then of opinion that there was no danger of the disease being introduced here at all, from the fact that it developed

very rapidly and soon ran its course. It was a very well-known fact amongst professional men that when the crisis of the disease was over, which was in about ten days, the animal suffering was no longer capable of spreading the disease. Seeing, however, that it had appeared at Sydney, precautions ought to be taken here. He had never seen the disease in sheep, pigs, fowls, or babies (laughter), but amongst cattle there was no disease so contagious. Here, from the manner in which stock were depastured, the disease would be very serious. In England a man could go with a bundle of hay and a bucket of water to each suffering beast, but in this colony, where cattle were grazing a number of miles from the nearest water, there would be no means of keeping alive those attacked by the disease. If the disease were introduced here most of the cattle on the runs would die. There would be no question of unwholesome meat—there would simply be no meat at all. There was no doubt whatever that if the disease once obtained a footing in this colony, it would kill one half of the cattle. In England the disease was not very fatal, but if it attacked a milch cow she speedily became dry, and the dairyman lost a season's milk, while in the case of fat cattle it made them thin, and reduced them to the condition of store cattle. No doctoring was permitted by the farmers for this disease in England. Medicines, external and internal, had been found to be of no benefit whatever, while external applications were mischievous, as they caused the disease to turn inwardly. There was not, in fact, a professional man in the whole country who could cure a single animal.

Mr. Graham Mitchell said, that within the last eighteen months the disease had assumed a new form. It was formerly not so serious, and sheep were exempt from it; but within the last eighteen months he believed it had become much more fatal, and sheep had been attacked by it. How long ago was it since Mr. M'Dougall was in England?

Mr. M'Dougall replied that he was in England in 1870. He had it from the persons interested, that the worst thing in the world, if the cattle had the disease, was to admit a medical man inside the fence. There was very little danger, he might say, of the disease being introduced into this colony by breeders, for they naturally took the utmost care to secure healthy stock. The danger came from the speculator, who, so long as he made his £20, £30, or £40, did not care if the whole stock of the colony were infected.

Mr. C. H. M'Knight thought the meeting should give some clear expression of opinion, and urge upon the Government the necessity of taking some steps in the matter. Mr. Mitchell said the disease attacked the human subject, while Mr. M'Dougall said it did not; but he (Mr. M'Knight) thought it would be better to err on the safe side. He considered the plain course for the meeting to take was, to urge upon the Government to communicate with the Governments of New South Wales and all the Australian colonies, in order that joint measures might be taken to prevent

the introduction of all stock from without for a time. He agreed with Mr. Mitchell that it would not do to prohibit the introduction of foreign stock for all future time; but we had here plenty of good sheep and cattle, enough for our own wants, and under these circumstances he thought the most sensible course the Governments of the different colonies could adopt would be to frame a series of regulations which, if they would not prohibit the introduction of foreign stock, would prohibit their introduction without passing such a period in quarantine as would render the introduction of the disease practically impossible. To prohibit the coming in of all stock from without until the disease disappeared from England would not do, because that might never be. He would move:—"That this meeting would respectfully urge upon the Government of Victoria that the danger of introducing the foot and mouth disease is one which affects the whole community, inasmuch as the human being is said to be liable to that disease. That the commercial interests of the community would be jeopardised by the fear of preserved meats being affected. That the Government be therefore respectfully requested to co-operate with the Governments of New South Wales, Queensland, &c., in taking steps to prevent the introduction of stock from foreign parts without stringent quarantine regulations." Then came the question of the possible introduction of the disease from the other colonies. The foot and mouth disease having appeared in Sydney, he thought it was our duty to prevent the introduction of the disease from thence into this colony.

Mr. Kirk.—Is it proved that the disease has appeared in Sydney, or is it only assumed?

Mr. M'Knight had no personal knowledge; his information was obtained from the reports of others.

Mr. Kirk.—It is contradicted in to-day's papers.

Mr. M'Dougall.—Only as regards sheep.

Mr. M'Knight had never heard the report questioned, so far as regarded the existence of the disease amongst cattle at Sydney. He thought it might be assumed that the disease existed there, and it was to be remembered that although pleuro-pneumonia was first brought here directly by sea, it was afterwards in many instances reintroduced by cattle coming across the border. As the law now stood, we possessed all the necessary machinery for placing an inspection upon the cattle and sheep coming into this colony. At this moment the Government possessed the power to appoint an inspector of all diseased animals, and he thought the scab inspectors might receive this power. The Government seemed disposed to throw over the scab question altogether, and leave the disease to be dealt with by private hands; but in the face of this new danger, perhaps they would continue to employ the scab inspectors, and make them also inspectors of all diseased animals.

Mr. R. K. Hammond pointed out that all the cattle which had come in for some time past had come under the examination of the inspector for the Melbourne district. No cattle were even now

permitted to land without undergoing supervision and inspection by a veterinary surgeon. (A Voice.—"But they have not been put into quarantine.") They were not put into quarantine, but they were virtually placed in quarantine, because they were not permitted to land until they had been inspected. If the disease ran its course in ten days there was not much danger after all of its being introduced here, but it was a singular fact that the disease had appeared at Sydney amongst the stock of one of those very persons whom Mr. M'Dougall said would be the last to introduce any disease. He agreed, however, that it was desirable to establish some sort of quarantine.

Mr. Kirk agreed with the mover of the resolution, that the Government should be called upon to exercise greater vigilance, but he thought it would be monstrous to say that henceforth we would have no dealings with the outside world because we had sufficient stock for ourselves in the colony.

The motion having been seconded by *Mr. John Cooper*, a discussion arose as to whether the foot and mouth disease was one which attacked the human species.

Mr. M'Dougall denied that the disease had ever appeared in any human subject at home. While in England himself he had handled fifty diseased animals, and he had never heard it suggested even that there was any danger in so doing.

A gentleman present drew attention to the fact that the Government veterinary surgeon at Sydney had expressed the opinion that the disease might be communicated to man by the use of infected milk.

Mr. Wm. Thomson, surgeon, said that the question was now being discussed in the English medical journals.

Mr. Josiah Mitchell said he happened to have in his pocket an extract on the subject from the *Veterinarian*, which he would read: —"In Hertfordshire, Cheshire, and in other parts of the country, infants and young children have been affected with many of the familiar symptoms of foot and mouth disease, occasioned by their drinking the milk of cows suffering from this contagious disease. In the medical journals, Dr. Alfred Packman, of Puckridge, is stated to have recently treated several children suffering from the peculiar eruption of the mouth, nose, and face, accompanied by sore tongue and throat and salivation." Dr. Packman has no doubt that the symptoms resulted from the patients having used the milk of affected cows. Where the foot and mouth poison in a state of activity has not been swallowed in quantities sufficient to reproduce the special disorder in children, it very frequently proclaims its injurious presence by inducing sickness and diarrhœa. Somewhat similar results occur among calves, many of which have troublesome and often fatal diarrhœa, from being fed with the contaminated milk. Even pigs, which are supposed to have omniverous appetites and digestive vigour adequate to make away with almost any description of diet, have often sickened and died from being fed on murrain milk, which the ignorant, senseless owners fancied was "too good to waste."

The resolution was then put and carried unanimously.

Mr. M'Knight now proposed a resolution with reference to the danger to be apprehended from diseased cattle coming over from New South Wales, as follows:—"It having been reported that the foot and mouth disease has appeared in New South Wales, this meeting would respectfully urge upon the Government of Victoria the propriety of taking steps to prevent the introduction of that disease, pleuro-pneumonia, and other contagious diseases, from the neighbouring colonies."

A discussion ensued on the resolution, Messrs. Hammond, Hervey, M'Dougall, Search, and others objecting to the words "pleuro-pneumonia and other contagious diseases." It was contended that the meeting had been called with the express object of dealing with the foot and mouth disease, and it was pointed out, with regard to pleuro-pneumonia, that the disease was already existant in the colony. Eventually the resolution was amended by striking out the words in question, when Mr. M'Knight, who strongly urged the retention of the words, refused to proceed with the motion.

Mr. Peck moved the adoption of the amended resolution.

Mr. Search seconded the motion, which was carried.

The period of quarantine which the Government should be recommended to enforce was then discussed.

Mr. Hammond proposed that the period should be one month. A voyage took seventy or eighty days, and after a further period of thirty days there would be very little danger of the disease breaking out.

Mr. Search called attention to the fact, that on board the Madras, which went to Sydney, a bull died of the foot and mouth disease, and was thrown overboard, ninety-five days after leaving London.

Mr. G. Mitchell said an animal might linger for three months with sloughing of the joints, sores, &c., and he believed that as long as those discharges existed the animal might spread the disease.

Mr. M'Knight considered all precautions would be useless, unless there was a long period of quarantine. He moved that the period be three months.

Mr. Hammond said this would amount to a prohibition in the importation of stock. He suggested that the case would be met by fixing the minimum period of quarantine at one month, leaving it open to the inspectors to increase the time in particular cases if necessary.

This suggestion was accepted, and ultimately a resolution, moved by Mr. M'Knight, and seconded by Mr. Finlay, was agreed to in the following form:—"That all stock arriving be detained in quarantine for such period as may be considered requisite by the Government inspector, but that in no case shall this period be less than one month."

It was further resolved that the resolutions should be signed by

the chairman, and that he should wait, with the President of the National Agricultural Society, upon the Chief Secretary as a deputation, in order to bring them under the notice of the Government.

The proceedings terminated with a vote of thanks to the chairman.—*Melbourne Argus*, Jan. 24th, 1872.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF THE COUNCIL, HELD THURSDAY, APRIL 25TH, 1872.

Present—Professor Pritchard, Messrs. Balls, J. C. Broad, Cowie, Field, Gowing, Harpley, Lowe, Moon, R. Pritchard, Silvester, and the Secretary.

In the absence of the President the chair was taken by Mr. Clement Lowe.

The minutes of the two last meetings were read and confirmed.

Mr. Silvester asked the reason for altering the day of the meeting; it was usually held on Wednesday.

The Secretary said his time had been so fully occupied throughout the week with the examinations that he could not give the seven days' notice in time for Wednesday.

Mr. J. C. Broad remarked that in the minutes it was stated that this Council did not acknowledge the new schools.

Professor Pritchard said they had no power to recognise them.

The Secretary said the Council had nothing to do with them. He had been instructed to say that the Council had no power to recognise any school, and to forward a copy of the Charter, and refer the correspondent to page 4 of that document.

The Secretary read a letter from Mr. Owles, stating his inability to attend the Special Meeting. Also a letter from Mr. George Armitage, who desired to tender his resignation at the forthcoming Annual Meeting, in consequence of his numerous engagements.

Mr. R. Pritchard proposed that the resignation be accepted.

The Secretary read a letter from Mr. Vasey. Also a letter from Mr. Dunsmure, stating that fifteen students were examined in Glasgow, and three rejected. Thirty students from the Edinburgh College gave in their names. Twenty-

three passed, three were rejected, and four withdrew. The Secretary also read a letter from Mr. Cowie, offering to send a person from Bromley to give in an estimate for the repairs to the house, unless some one else had sent in an estimate. The Secretary read his reply to that letter, stating the Council had employed a person for the last seven years, who was well known to the house committee, and who had hitherto given satisfaction. Mr. Cowie's reply to this letter was next read.

The Secretary said he might state that Mr. Cowie was not the chairman on the occasion referred to, and that other members of the house committee had seen what was required to be done. He was sorry that Mr. Withers was not present. The same man who had hitherto done the work was employed by Mr. Withers, who was so much pleased with the work that he had done at the College, that he called him in, and employed him on several occasions. He might also state, that he considered it very objectionable for a man to be sent all the way from the neighbourhood of Mr. Cowie's residence to come and do so little repairs as were required. He (the Secretary) had hitherto superintended the repairs himself, and thought it would be objectionable for strangers to be coming into the College. The work had always been done satisfactorily.

Mr. Cowie said that as to his being chairman, he was appointed the year before last as chairman, and he understood that so long as he was a member of the Committee he would remain as chairman. All that he wanted was that they should keep strictly to the terms of the motion and take an estimate, and not allow a man to come and do the work; and be paid what he chose to charge.

The Secretary said that was never contemplated. An estimate had always been drawn out by the man, and, if acceptable to the Committee, passed and signed by them.

Mr. Cowie said that his object was merely to know what the estimate was, and if it was thought by the Committee to be high, that they should obtain another estimate from some other person. He thought that it was very likely a country tradesman would give a more moderate estimate than a town one. He did not see any use in appointing a committee at all if they had not some power delegated to them as to the nature of the work to be done and the amount to be charged. He had every confidence that Mr. Coates would see that the work was as moderately estimated as possible, and also that it should be well done, only it was his impression that as an estimate was to be given in, the Committee should have

some power of investigating it, and approving or disapproving it.

Mr. J. C. Broad said he quite agreed with Mr. Cowie as to allowing a man to charge what he thought proper, but at the same time he thought it was far preferable to employ a man who had been employed in these premises for seven or eight years to give in an estimate, and if the Committee considered it reasonable to accept it. That was far preferable to going to Bromley to employ a man.

Mr. Gowing said the matter was in a complete nutshell. The Council had ordered that an estimate should be given for the necessary repairs, and he believed that such an estimate had been given and gone into by the house committee.

Mr. Cowie said he had never seen it. If the Council made him responsible as a member of the Committee, he must have something to say in the bargain.

The Chairman said it did not seem to follow from the minute that one man only was to give an estimate, but there might be twenty estimates, but he did not think it was necessary to proceed further in the matter.

Mr. Silvester said he did not see any objection to Mr. Cowie sending his man up from Bromley.

The Secretary stated that he had informed the man who usually did the work that the repairs were only to last till the remainder of the lease, which had only two or three years to run. The man had always taken his instructions, and had not put the College to a shilling expense more than was necessary.

Mr. Silvester urged that the Council should proceed with the business of the meeting.

The Secretary said the next subject was the door-plate. He was sorry to have to announce that it had been removed, by some persons, from the front door. Two other houses in the neighbourhood had suffered from similar depredations, and in Bedford Row several door-plates had been taken away. He was up at six o'clock in the morning, and discovered the loss. The police stated that they would make every inquiry, and the result was that two men were now in custody, and were to be brought up for examination the next day; but as to where the plate was, no information had been obtained. The question was what should be done?

Mr. Harpley suggested that they should have another plate.

Mr. Silvester thought the matter had better be referred to the house committee.

Mr. R. Pritchard said that on looking at the pins which were in the door, it appeared that they had only been soldered to the plate, so that the thieves had not much trouble in taking it off.

The Secretary stated that if it met with the views of the Council that a new plate should be ordered, he would take care that it should be rivetted through the door.

Mr. J. C. Broad proposed that a new plate should be ordered.

Mr. Gowing thought it better to wait for the decision of the magistrate to-morrow, to see if the delinquents would confess what they had done with the plate. He should propose as an amendment that the matter be left to the house committee.

(The amendment was agreed to.)

The Secretary said the next subject was the report of the Report Committee. He might inform the Council that the report had been submitted to Mr. Fleming and Mr. Lowe. Mr. Wilkinson was so much engaged that he was not able to look over it. It was not returned until 10 o'clock the previous night.

(The Twenty-ninth Annual Report of the Council was then read.)

Mr. Harpley proposed that the report be received.

Mr. R. Pritchard seconded the motion.

(Carried unanimously.)

The Secretary then read the report paragraph by paragraph for any discussion which might arise upon it.

The motion that the Report be adopted and printed was then put to the Council, and carried unanimously.

The Auditors' Report was read and approved of.

Mr. Gowing asked if he should be in order in offering some remarks upon the imperfect manner of balloting at the Annual Meetings. He did not think it gave gentlemen a fair chance who had proposed candidates as members of the Council. He alluded more particularly to the balloting papers. They were issued before the names of those gentlemen had been read over who had been proposed by any of the members present, and so many of them were hastily filled up without there being an opportunity of adding the name of any person for whom the member would have been otherwise desirous of voting. He thought the papers ought to be retained by the Secretary until the names of all the individuals nominated had been clearly read out to the meeting.

The Secretary said he thought there was a by-law with reference to that matter. It was as follows:—"Ten days

prior to the Annual General Meeting, held on the first Monday in the month of May, the Secretary shall prepare a list stating the names and residences of the persons proposed, and also of the members of Council who remain in office, as well as those who retire by rotation," &c.

Mr. Gowing said that at the last meeting he heard the Secretary call out once or twice for names to be given in, although the balloting papers were distributed and being filled up. This was not fair to the new candidates.

The Secretary said there was another by-law to the effect that "Such members of the College as may be desirous of having the names of any persons they may propose as members of the Council included in the list, must give notice thereof in writing to the Secretary on or before the 14th April; but any member may be proposed at the Annual Meeting, notwithstanding his name may not be on such list."

Mr. Silvester thought there was plenty of opportunity for any gentleman to put the name of any person he wished to vote for in the balloting paper.

The Chairman said there was no power to alter the arrangements under the existing by-laws.

Mr. Silvester reported that the Dinner Committee had been unable to find accommodation at the Albion, and therefore they had arranged to have the Annual Dinner at the London Tavern. He suggested that the President should announce this fact early at the Annual Meeting, so that there might be no misapprehension.

The Secretary said he would have the announcement altered in the *Veterinarian*.

(The proceedings then terminated.)

ROYAL COLLEGE OF VETERINARY SURGEONS.

ANNUAL MEETING, HELD MAY 6TH, 1872.

BENJAMIN CARTLEDGE, Esq., President, in the Chair.

The twenty-ninth Annual Meeting of the Members, politic and corporate, of the Royal College of Veterinary Surgeons, was held by advertisement, and in accordance with the provisions of the Charter, on the first Monday in the month of May, being the 6th day thereof, 1872, at the College, 10, Red Lion Square, Holborn, London.

PRESENT:—The President, Benjamin Cartledge, Esq.; Pro-

fessors Simonds, Pritchard, and Williams; John Wilkinson, Esq., Principal V.S. to the Army; Messrs. G. Balls, G. Balls, jun., T. D. Barford, H. T. Batt, W. C. Branford, T. D. Broad, J. C. Broad, Alfred Broad, T. Burrell, jun., H. J. Cartwright, M. Clarke, W. H. L. Clark, T. Colley, T. Corby, James Cowie, E. C. Dray, W. Duguid, William Field, jun., Col. Fitzwygram, G. Fleming, T. W. Gowing, T. W. Gowing, jun., T. Greaves, M. Hack, James Hall, W. Helmore, R. L. Hunt, William Hunting, W. H. Kent, H. Lawrence, John Lawson, H. G. Lepper, Clement Lowe, T. W. Mayer, James Moon, James Moore, jun., M. E. Naylor, C. Offer, A. J. Owles, Henry Peele, T. S. Price, James Rowe, jun., Capt. B. H. Russell, C. C. Sanderson, F. R. Silvester, H. L. Simpson, William Smith, T. W. Talbot, S. Tremlett, W. Varley, F. Walker, W. Wilson, Joseph Woodger, Edward Woodger, Joseph Woodger, jun., T. W. Wragg, and the Secretary.

The Secretary read the notice convening the meeting.

The minutes of the last meeting were read and confirmed.

The Secretary then read the twenty-eighth Annual Report, including the Treasurer's Annual Balance-sheet.

REPORT.

At the Annual General Meeting, held May 1, 1871, in accordance with the provisions of the Charter, the following gentlemen were elected Members of the Council viz.:—Messrs. Simonds, Silvester, Broad, Burrell, Cartledge, Armatage, and Balls.

The Council of the Royal College of Veterinary Surgeons has to report to the Body Corporate that at its First Meeting, held May 23rd, Benj. Cartledge, Esq., of Sheffield, was elected President, and the following gentlemen were elected Vice-Presidents:—Professors Brown, Williams, and McCall, Messrs. Owles, Naylor, and Lowe; Treasurer, Mr. S. H. Withers; and Secretary, Mr. W. H. Coates.

In preparing an Abstract of the Proceedings of the Council for the past year, it must be mentioned that a subject of the highest importance to the profession has been the introduction of a Practical in addition to the Oral Examination of the students. Its operation has been found effective in preventing the admission into the profession of gentlemen who have not acquired that practical knowledge which the public has a right to expect from persons holding the Diploma of the Royal College of Veterinary Surgeons.

The scheme which the Examination Committee laid before the Council for its guidance has been adopted with success; the only drawback being some inconvenience to the Examiners in London, arising from the means as yet available for carrying out the Practical Examination, viz., the Cattle Market, Islington, and Mr. Matthews' premises in Theobald's Road. It is hoped that some more suitable arrangements may be obtained for so desirable an object.

The Practical Examinations conducted in Edinburgh and Glasgow have also been systematically carried out, and the Principals of the respective schools have afforded every facility to the Examiners.

An intimation has been recently conveyed to the Council that the Governors of the Royal Veterinary College have decided to introduce a Summer Course of Lectures, from which the students, and more especially the rejected ones, should derive considerable advantage previous to a subsequent Examination.

The Council has also directed its attention to the subject of rejected Candidates, as regards their eligibility to appear before the Court of Examiners for re-examination.

It was found that in several instances such students had neglected to resume their studies, and, in order to meet this requirement, the Council has amended "Bye-law 33," which now states—

> "That no rejected pupil shall be eligible for re-examination unless he produces a certificate of having received further instruction at one of the recognised schools."

The Council has recently had under discussion the advisability of abolishing the Christmas Examination. After discussion it was decided to continue the same. It has been thought that the time has now arrived when the Students' Examination Fees might justly be raised from seven to ten guineas. To carry out this project, however, there must necessarily be an alteration in the Bye-laws; and before any steps of a definite character are taken, the Council is desirous that the opinion of the Principals of the respective schools should be obtained. The subject has been deferred for future consideration.

The Council regrets having to announce the loss of one of the most distinguished Members of the Examining Board, viz., Mr. William Robinson, of Tamworth, who so ably assisted in Examining at the Cattle Pathology table during a period of twenty-three years.

The Council has the satisfaction to be able to announce that the vacancy has been filled up by the election of Mr. Robert L. Hunt, of Birmingham.

Seventy-six pupils from the different schools have received the Diploma of the Royal College of Veterinary Surgeons during the past year, and four have availed themselves of the Special Examinations, making a total of eighty Members who have been admitted into the Body Corporate.

The Registrar reports the death of twenty-nine Members of the profession since the last Annual Meeting. Among those most regretted by the profession is that of Professor Spooner, late principal of the Royal Veterinary College, who died Nov. 24th, 1871. He was one of the chief promoters for the obtainment of the Royal Charter of Incorporation, and was elected one of the first Members of Council of the Royal College of Veterinary Surgeons, which office he held up to the time of his decease. He was elected a Vice-President in 1844, and President of the College in 1858, and was an Ex-officio Member of the Examining Board of the Royal College of Veterinary Surgeons.

It is also the painful duty of the Council to record the death of the late Mr. Wm. Robinson, of Tamworth, in the 85th year of his age. He was elected one of the first Members of Council after the obtainment of the Charter, which office he held for a period of twenty-eight years. He was elected President of the College in January, 1851, and re-elected in May of the same year; was Vice-President in 1845, and re-elected in 1846. He was elected a Member of the Board of Examiners in 1848, which office he retained to the day of his death.

The Annual Register of Members of the Royal College of Veterinary Surgeons has been published during the past year. A new edition will shortly be issued gratuitously to Members of the profession on application to the Registrar.

Presentations have been made to the Library and Museum by Mr. Fleming, Royal Engineers, Mr. J. C. Broad, and the Secretary.

During the past year the Central Veterinary Medical Society applied to the Council for the use of the Board-room in which to hold their Meetings; this request was granted for twelve months.

The Financial Report is annexed. The Balance in hand, after defraying the expenses of the year, amounts to £67 13s. 8½d.

S. H. WITHERS, TREASURER, *in Account with the Council of the Royal College of Veterinary Surgeons, From* APRIL 1*st*, 1871, *to* MARCH 31*st*, 1872.

Dr.	£	*s.*	*d.*	Cr.	£	*s.*	*d.*
Balance at Bankers', April, 1871	162	6	2	Examiners' Fees and Expenses	387	16	11
Examination Fees	693	0	0	Rent	60	0	0
Interest on Deposit Account	0	10	2	Rates and Taxes	38	3	1½
Dividends	17	3	8	Salary to Secretary	100	0	0
Registers	0	15	0	Insurances	1	18	9
Property Tax	1	10	0	Advertisements	9	7	7
Gas consumed by C.V.M.Soc.	1	17	6	Printing	20	7	0
				Stationery and Postage Stamps	11	2	8
				Reporters	7	17	6
				Law and Parliamentary Agents	8	18	6
				Coals, Gas and Wood	15	8	3
				Drugs	0	4	4
				Repairs and Alterations in Museum	4	8	10
				House Repairs	4	5	10
				Furniture	1	2	6
				Petty House Expenses	18	7	0
				Wages	20	0	0
				Purchase of Stock in 3 per cent. Consols and Brokerage	100	0	0
				Balance at Bankers'	67	13	8½
	£877	2	6		£877	2	6

Amount of Stock standing in the names of the Trustees £640 19 11, Three per cent. Consols.

We, the undersigned, have examined the above accounts, and have found them correct.

April 12, 1872.

HARTLEY T. BATT,
J. ROALFE COX, } *Auditors.*

XLV. *Mr. Dray* proposed that the report be received.

Mr. Wilson seconded the motion, which was unanimously agreed to.

Mr. Pritchard moved the adoption of the report.

Mr. Gowing seconded the motion.

Mr. Wilson said he was quite sure the meeting were in entire accord with the Council in regard to the loss it had sustained by the death of two of its members. He desired to bear his own personal testimony to the great perseverance and energy which those two gentlemen had exhibited, and the efforts they had put forth to promote the interests of the profession.

Mr. Mayer said he wished to make a few observations on the death of his lamented friend Mr. Robinson. It might not be known to all present that he was very active in promoting, first of all, the memorial presented to the Governors of the College, and afterwards the petition presented to the Government for a Charter. It was his, Mr. Mayer's, good fortune to act with Mr. Robinson on that occasion, and he desired to bear testimony to his worth as a professional man and as a member of society. He supposed there was no man in his own neighburhood who was more highly esteemed and respected. He wished to make one observation with regard to the Treasurer's account. He held in his hand the account presented from April, 1849, to March, 1850, and it appeared from that document that he then presented to the College the sum of £37 14*s.* as a donation towards the building fund. He observed that in the present account there was a sum of £640 19*s.* 11*d.* standing in the names of the Trustees, and he wished to know if the building fund formed any portion of that sum. The donation which he had made to the College, with interest, would now amount to about £70. If it had not been kept separate from the other fund, he wished that it should be so in order that it might form the nucleus of a fund to which other members of the profession might be disposed to contribute. This would be the more desirable, as the College would soon have to leave the premises in which it was at present located.

The Secretary said that the money had not gone into a separate fund, but into the general account.

Mr. Helmore said he hoped that the Council would carry out the wishes of Mr. Mayer. He had no doubt that many would be disposed to contribute to the fund if they knew of its existence. The College was very much behind the times as compared with other corporate bodies and institutions of less importance than this.

Mr. Dray referred to the paragraph in the report respecting the inconvenience experienced by the examiners in carrying out the practical examinations at the Cattle Market, Islington, and Mr. Matthews' premises in Theobald's Road, and inquired if there was any probability of more suitable arrangements being made, according to the hope expressed in the report. He wished also to inquire of Professor Williams whether at Edinburgh and Glasgow the practical examinations were carried out at the schools?

The President said that the examinations were partly carried out at the schools.

Professor Simonds said it was his desire to do all he could to remove the grievance complained of. The matter, however, did not rest with him, but with the governors of the institution with which he was connected, and he could not, therefore, at that moment give a more definite reply to the question which had been asked. He could only say that, so far as he was individually concerned, every effort should be made to carry out the wishes of the Council.

Mr. Hunt said that whatever sacrifices were made, were made by the examiners themselves, who were obliged to carry on an examination at a distance from town. The efficiency of the examinations themselves was in no way impaired.

Mr. Wilkinson said that, as far as the practical examination of horses was concerned, the examiners did not think the place the best in the world for that purpose, but in other respects it was admirably adapted to the examination. The examiners had a good choice of subjects to place before their pupils, and they made their selections from day to day. The desire for an alteration arose chiefly from the feeling that it would be more creditable to them all if the examination were conducted at an institution like the Royal Veterinary College (hear, hear), and he would do what he could towards the promotion of that object.

Mr. W. Hunting said if the examination fees were raised from seven to ten guineas the body corporate might have a place of its own in which to examine students. If the examinations were conducted at the Veterinary College invidious remarks might be made with regard to students being examined upon a number of patients who had been for some time within the walls of the Institution in which they were taught. There was an institution in London containing a large number of sick and lame animals where the examinations might be held with advantage. He referred to the "Brown Institution," which would be a much better place than a cab-yard, and which would not be open to the objec-

tion he had named. He saw no reason why the examination fees should not be increased. The body corporate would run the risk of becoming bankrupt if the present scale of fees were retained. There was very little difference in the present year between the amount received and the cost of the examination.

The President stated that £100 had been deposited this year, which did not appear in the financial statement.

Mr. Russell said it ought not to be forgotten that those who attended the examination were put to the expense of going to the Cattle Market. He demurred to the idea of the yard in Theobald's Road being a proper place to examine horses in. It was a cab-yard with a stable on either side. There was a roof projecting half way across the yard, so that if a student wanted to examine a horse's eyes he had to bring him out, so that the sun's rays came slanting down upon them. Fearing that he would be too long in making his examination the student might be induced to hurry over his work, and perhaps might pass over many defects that he would otherwise observe. Then, again, the ground was very rough and bad, and it was impossible to tell whether a horse was lame or not. He believed they were safe in leaving the matter in the hands of Professor Simonds.

Mr. Wilkinson said that no place could be better than a stable-yard for the examination of horses. The student was not obliged to examine the horses under the shed. He was sorry to say that some did so, and he thought it very bad practice on their part. The examiners, however, were perfectly satisfied with the place in that respect. The rough part of the road was preferred by the pupils. When it was prepared by throwing a little straw over it was pooh-poohed by them, for they preferred the rough gravel.

Mr. Hunting said that when the College was turned out of its present house it would require the £100 to which the President had alluded, and a great deal more.

Mr. Smith thought that a strenuous effort should be made among the members of the profession to alter the present state of things, and to place the profession in a better position with the public. He thought that premises might be obtained with suitable yard and stable in which to conduct the examinations, without being dependent upon any other body, or subjecting the examiners and pupils to any humiliation on account of the premises in which they were engaged. He thought the time had scarcely arrived when the examination fee should be increased, but he hoped that in a few years that increase would be made, and that a more complete

preliminary examination would be exacted from the pupils. Without such an extended examination he should object to any increase in the fee.

Mr. Simpson objected to the College throwing its money away in providing stables and buildings which would be only needed four or five days in a year. The College should of course have a respectable place to which the members of the profession could go, and he was willing to subscribe his mite to that object, but it would be perfectly ridiculous to throw money away for such a scheme as that suggested by Mr. Smith.

Mr. Fleming said that the lease of the present house had only two years to run, and he believed that if a suitable appeal were made to the profession, sufficient funds would be obtained to enable the College to move into a respectable residence. He hoped that the subject would be taken into consideration at an early meeting of the Council.

Mr. Helmore said that the question of the examination fees should be left for the decision of the Council with the concurrence of the professors of the different institutions concerned.

Professor Williams said that the professors had no interest in the matter. Their desire was to see the profession thoroughly united. If the fees were altered disunion would be introduced. He hoped, therefore, that the subject would be allowed to drop. The gentleman who made the suggestion was quite willing that it should remain in abeyance, in order that what had been done might not be undone, and that unity and good feeling might continue to be promoted. He saw no reason, however, why rejected students should not pay for a second examination.

Mr. Corby said he had no doubt that the money would be obtained when it was wanted, and meanwhile the matter might rest where it was.

Mr. Greaves said that every one must be gratified at the remarks of Professor Simonds and Mr. Wilkinson. In the Scotch schools every effort had been made to assist the examiners in regard to the practical examinations, and he was glad to hear that hopes were held out that the London College would follow the example. The practical examination was attended with additional expense, which ought to be reimbursed; and he thought the suggestion of Professor Williams an excellent one, that rejected students should pay for a second or third examiuation.

The President said that in Scotland facilities were offered by the colleges to the examiners, and the thanks of the

Council were due to Professor Williams and M'Call for the ready assistance they had rendered. The examination of horses in the Edinburgh school was conducted in the college yard, and the practical examinations of cattle were conducted in a market near at hand. In Glasgow they were conducted on Professor M'Call's farm. With regard to examination fees, the motion made on the subject of the increase at the meeting of the Council was withdrawn, the general feeling being that it was premature to make any advance. With regard to a new building, he had no doubt when the proper time came that an appeal would be made to members of the profession and would be liberally responded to. He wished to call attention to an effort that was being made in Tamworth to obtain a memorial of the late Mr. Robinson of that town. A meeting had been held for that purpose, at which a considerable number of gentlemen of influence in the neighbourhood attended for the purpose of doing honour to Mr. Robinson's memory. It would be for the members of the College to consider whether they could co-operate in any way in that movement.

The election of nine members of the Council then took place.

The following gentlemen retired by rotation:

Mr. J. Moon, Mr. W. Pritchard, Mr. T. Greaves, Mr. G. Fleming, Mr. R. L. Hunt, and Mr. T. W. Gowing.

Two other members were required to be elected in the place of Mr. C. Spooner and Mr. W. Robinson deceased, and one in the place of Mr. Armatage resigned.

The following gentlemen were nominated:

Professor Williams	by Mr.	Wilkinson.
,, Brown	,,	Wilkinson.
Mr. Hunt	,,	Silvester.
,, Gowing	,,	J. C. Broad.
,, Lowe	,,	Owles.
,, E. C. Dray	,,	Wilson.
,, Greaves	,,	Hunt.
,, Joseph Woodger	,,	Hunting.
,, Smith	,,	Dray.
,, Fleming	,,	Price.
Professor Pritchard	,,	Gowing.
Mr. Axe	,,	Gowing.
,, Moon	,,	J. Woodger, jun.
,, T. W. Mayer	,,	W. Field, jun.
,, M. E. Naylor	,,	Cowie.
,, Hunting	,,	Woodger.
,, Owles	,,	Varley.
,, Helmore	,,	Tremlett.

Mr. Hack and Mr. Lepper were appointed scrutineers. While they were engaged in counting the votes,

Mr. Smith again drew attention to the subject of the Building Fund, and suggested that the Council should take the matter into consideration, with a view of carrying out the wishes of Mr. Mayer.

Mr. W. Field, jun., expressed his concurrence in the suggestion.

The President read the following statement from the *Tamworth Herald*, respecting the meeting held in that town in regard to a memorial to the late Mr. Robinson.

"*Memorial to the late* Alderman Robinson.

"On Tuesday, a public meeting, called by Mr. E. Hooper (Mayor), in accordance with a resolution passed by the Town Council, was held in the Town Hall, Tamworth, for the purpose of taking into consideration the erection of a suitable memorial to the late Mr. William Robinson, and to inaugurate such proceedings as might be necessary to carry out that object. There was a good attendance of the leading public men of the borough.

"*The Mayor* read letters of apology from Mr. Evans (Derby), Mr. Mavor, Mr. Skey, Mr. Mallaby (Grendon), and Mr. Woody, and in commencing the proceedings, said it had been his good fortune to know the late Mr. Robinson during the last few years of his life. He believed that in all respects Mr. Robinson was justly respected and highly esteemed by the inhabitants of Tamworth. For a number of years he was one of the aldermen of the borough, and for three or four years he filled the high and important office of Mayor. As chief magistrate no man was more impartial, and in his private capacity no one knew him to be guilty of any act which did not become a gentleman. Mr. Robinson was deservedly respected by every one, and he (Mr. Hooper) felt great pleasure in presiding over a meeting for discussing what they were to do by way of erecting some tribute to his memory. Mr. Hooper concluded by calling upon Mr. Burley, late veterinary surgeon, of Leicester, to move the first resolution.

"*Mr. Burley* said he had known Mr. Robinson for 60 years, and had been connected with him as councillor, vice-president, and president of the Royal College of Veterinary Surgeons, and could testify to his kindness, geniality, and honesty of character. He complained strongly of the absence from that meeting of some members of the veterinary pro-

fession, for which Mr. Robinson worked so hard and so long. Mr. Burley next referred to Mr. Wm. Robinson's abstemious habits, which had enabled him to live to a ripe old age, but regretted that their friend had at last died a poor man, in harness, caused principally by his performing a great amount of his practice gratuitously. He did not believe in that system, and in his (Mr. Burley's) career he had always looked after 'number one'—(laughter). He believed the memory of no man that ever lived deserved more honour than his late friend Mr. Robinson's, and it was with the greatest pleasure he moved the resolution entrusted to him—"That it is desirable that a suitable memorial should be erected to the late William Robinson, and that a subscription be entered into for that purpose"—(applause). Mr. Madan seconded the resolution, which was carried unanimously.

"*Mr. Shaw*, in moving the next resolution, said it was impossible at present to say what form the memorial would take—whether it should take the form of a scholarship connected with the Royal Veterinary College, or whether it should be some kind of statue, was a question which would have to be considered at future meetings. The proceedings which had already been taken were in strict accordance with the precedent which was set in the promotion of the memorial to Sir Robert Peel some years ago. He proposed that the following gentlemen should be asked to form a committee, in addition to the committee already existing:—Earl Shrewsbury, Lord Howe, Lord Bagot, Lord Waterpark, Sir Robert Peel, M.P., Mr. Newdegate, M.P., Mr. Bass, M.P., Mr. A. Bass, M.P., Mr. R. W. Hanbury, M.P., Mr. F. Monckton, M.P., Mr. Bromley-Davenport, M.P., Major Thorneycroft, Captain Leigh, Captain Webster, and Messrs. Inge, Floyer, T. W. Evans, W. Bass, Leech, C. W. Lyon, Skey, Madon, Burley, Darby, Potter, Oakley, Walter Williams, Brown, Argyle, and Jennings, with power to add to their number. Mr. Shaw said he had spoken to several of the gentlemen enumerated, and they had consented to act. It was impossible to find a man more universally respected, and by whom a memorial was more deserved, than the late Mr. Robinson."

Mr. Wilkinson said he should be glad to hear an expression of opinion from the meeting as to the number of times that a student could present himself for examination. Instances he said had occurred in which a student had presented himself five or six times.

Mr. Wilson thought that a student should be entitled to present himself as many times as he liked, paying three guineas for every examination after the first.

Professor Williams agreed in the views expressed by Mr. Wilson.

The President said that each examination cost the College thirty guineas.

Mr. Gowing thought that some leniency should be shown to the rejected student, and that he should be allowed to present himself a second time without any additional charge. He thought that a payment of three guineas upon the third examination would be a sufficient amount of pressure to be put upon him.

The result of the ballot for the election of members for the election of members for the Council was as follows :—

Professor Williams	37
Mr. Fleming	37
Professor Pritchard	29
Mr. Greaves	29
,, Moon	29
,, Gowing	29
,, Hunt	28
Professor Brown	25
Mr. Dray	22
,, Lowe	20
,, Mayer	16
,, Woodger, jun.	13
,, Owles	13
,, Axe	11
,, Hunting	11
,, Helmore	10
,, Naylor	9
,, Smith	7

The President declared the following gentlemen elected: Professor Williams, Mr. Fleming, Professor Pritchard, Mr. Greaves, Mr. Moon, Mr. Gowing, Mr. Hunt, Professor Brown, Mr. Dray.

It was then decided by lot that Mr. Moon should take the place of Professor Spooner, Mr. Gowing that of Mr. Robinson, and Mr. Dray that of Mr. Armatage.

A vote of thanks was accorded to the President and the meeting terminated.

CENTRAL VETERINARY MEDICAL SOCIETY.

The usual monthly meeting of the above Society was held at 10, Red Lion Square, London, on Thursday, May 2nd, 1872; the President, George Fleming, Esq., F.R.G.S., in the chair.

After the reading of the minutes, a ballot took place for the election of Professor Tuson as an Honorary Fellow, and Assistant-professor Axe as Fellow of the Society. Later in the evening these gentlemen were declared to be elected by twenty-one votes.

The President introduced to the notice of the members a morbid specimen of diseased heart on behalf of Mr. Martin, of Rochester, who was unavoidably absent. The animal from which the specimen had been taken was an aged mare, and the symptoms evinced were—extreme distress when moved, an irregular and intermittent pulse, the mucous membranes raised by effusion, the veins replete with blood, and a dropsical condition of the body. The *post-mortem* examination showed the heart to be almost filled with fibrin; there were also deposits on the valves, which were much diseased, those on the right side being the most affected; the parietes were thin, and the whole heart was much enlarged.

Mr. Wragg laid before the meeting a diseased kidney of a horse. The animal during life evinced no symptoms of renal affection; he had been in the habit of driving the horse himself till, being destroyed for an affection of the lungs, a *post-mortem* was made. The kidney was large and softened, and small quantities of pus escaped from its pelvis; it was enlarged to a considerable extent (as also the other, which was not exhibited); externally it was whitish, and when opened appeared hypertrophied, and to be studded with fatty deposits; more closely examined, small abscesses were discovered, but no large ones.

Mr. A. Mavor showed a portion of the cæcum of a horse that had died from superpurgation. The attack had come on suddenly, the pulse being imperceptible, attended with excessive prostration and shivering, continual purging, the fæces becoming discoloured from an admixture of blood; the temperature taken previous to death stood at 100⅖. After death the rectum and cæcum were found to be black with effusion, the mucous coats only being affected; the stomach was healthy, and its contents undergoing the natural process of digestion. There had been no symptoms of purpura during life. Of the previous history of the horse little was known, save that it was a recent purchase from the country, and that the symptoms were sudden in their appearance.

The President observed that this case bore some resemblance

to anthrax; he believed it was due to submucous hæmorrhage, or an apoplectic condition of intestine.

Mr. Field observed that he had recently met with a similar case in a pony, which had just before returned from a ride. He had not seen it alive; in this instance the stomach also had bled.

Mr. F. J. Mavor said that, with the probability of an outbreak of cholera in England, such a case as this should be made known in medical circles, as it bore an analogy to that disease. Having seen the case during life he took that view of it, from the fact of the horse eating well, yet, suddenly perspiring, the other symptoms as quickly ensued; the fæces that were removed from the intestines he explained were most fœtid.

The President thought the remarks of the last speaker should be well considered; choleraic fæces, he explained, were white, not sanguineous.

Mr. Woodger, jun., instanced two cases in one establishment, where, after colicky symptoms and quick death, the mucous membranes of the intestine were found distended and much thickened.

Messrs. Moore and *Hunting* considered the specimen simply the result of inflammation of the bowels; but it was shown that there was no serous effusion or exudation of lymph, peritoneal inflammation, or pain, because the nerves were paralysed.

The President then called on Mr. F. J. Mavor to read his paper on "Animal Heat and Rise of Temperature from Disease." He read as follows:

"It is a well-established fact that a living animal body is constantly eliminating heat from the elements of nutrition to keep the blood up to a certain fixed normal temperature, however much it may differ in the different species of the same class; for instance, among the mammalia, man has a temperature of 98°, the horse 100°, the ox 101°, the dog 103°, goat 103°, fox 101°. But the animal heat, or, what it might be more properly called, the natural gas or atmosphere of the body, performs very important functions; namely, it is essential to the fluidity of the blood and elasticity of the tissues, by separating the globules and fibres, and it is its absence that allows the blood to coagulate and the body to lose its elasticity after death; it is also the source from which the nerve force is derived. To explain this I must call your attention to the fact of correlation of forces, *i. e.* heat, light, electricity, chemical force, motion, &c., may each be converted to and produce the other; as heat in the steam engine produces motion, so animal heat produces or is correlated into nerve force—in other words, muscular action, secretion, circulation of blood, and all the functions essential to life. My present

impression being that this correlation of force is accomplished by the peripheral extremities of the nerves collecting, converting, and conveying the heat as nerve force to the brain, spinal marrow, and large ganglia of the nervous system, and by them again being distributed through other nerve fibres to the glands, muscles, and other organs of the body, manifesting itself in motion, secretion, and chemical action.

"If I have so far made my meaning clear to you, and my conclusions be correct, it follows that you have the cause of the rise of temperature from disease; for if heat is constantly being produced, and only a portion of it consumed in keeping up the normal temperature of the body, the other portion being converted by the nerve filaments into nerve force, it also follows that any arrestation to the function of the nerves will produce an accumulation of heat and rise of temperature of the body. This is exactly what does take place; for instance, in a case of fever from deranged function of pneumogastric nerves, an enormously high temperature with loss of digestion and secretion in the alimentary canal and skin. On the other hand, tetanus, where there is morbid irritability of nerve filaments and excessive muscular action, the temperature remains normal; also in congestion or apoplexy of the lungs, though the surface of the body feels cold, we have an enormous increase of internal temperature; and, again, the diversion of a nerve will produce a rise of temperature. I could also instance the rapid reduction of normal heat after the subcutaneous use of the vegetable alkaloids, but that would trespass too much upon your time, and comes more under the head of the action of medicines, a subject I trust a scientific committee will some day be appointed to inquire into. The present object of this paper being to lead to a more careful investigation as to the rise and fall of animal heat and the control the nerves have over it, for it is generally admitted that derangement of temperature and disease are closely connected; and if the nerves control the temperature, so also may it be said that derangement of nerve function is the cause of all disease. In conclusion, I would add, that you must consider the variations of temperature, also the function of the nerves, and the effect produced by their derangement, before you can diagnose a disease, or with any certainty select the proper remedy for its treatment."

Mr. Hunting deemed the subject had been treated hypothetically; the clotting of blood, he held, was due to the presence of a foreign body, and that animal heat depended on chemical changes in the body; that in tetanus and fever the temperature was high, yet it was attended with great loss of tissue.

(Mr. Mavor had stated that in tetanus the temperature was not high.)

The President said that we could scarcely draw the distinction between health and disease. But a few years ago the humoral system was held, and now with fresh investigations the nervist system is being advanced; he felt that Mr. F. J. Mavor was our pioneer in this respect, and that he had given out statements that were difficult to overthrow.

Mr. Burrell said, if Mr. Mavor's opinions were correct, and the circulation depended on previously existing nerve force, he could not understand why blood did not coagulate after neurotomy.

In replying to the questions started by the Fellows, *Mr. Mavor* said, "His theory was, that heat was correlated or converted into nerve force, when it is something different from animal heat, as when heat becomes converted into electricity it is still heat but with extra qualities. As long as blood remains in contact with nerve force, it is fluid; remove the vitality by mechanical means or death, and coagulation then ensues. Of increased heat after neurotomy he said it was an established physiological fact, he did not speak of his own experiments, but of recorded accounts. Neurotomy separates the power that conveys heat and that which removes it, so there is no power to take it away; and that the whole of the nerve force is not destroyed, or death of the part and consequent coldness must ensue."

It was then proposed by *Mr. Moore, senr.*, seconded by *Mr. Jarvis*, and carried, that the further discussion be adjourned till next meeting.

Mr. J. W. Axe was declared elected a Fellow, and Professor Tuson an Honorary Fellow, each by twenty-one votes, and Colonel Fitzwigram was proposed as a Fellow.

Mr. Hunting announced that he would offer a few remarks on Local Anasthæsia on the next night of meeting, after which the meeting adjourned.

James Rowe, jun.,
Hon. Secretary.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The spring quarterly meeting was held at the Queen's Hotel, Leeds, on Tuesday, the 30th April, the President, Mr. Cuthbert, in the chair. The following members were also present, viz. Messrs. Naylor, Greaves, James Freeman, Nicholson, Patterson, Fearnley, Ferguson, and the Secretary. Letters explaining non-attendance were received from Messrs. Dray, Fryer, Bale, Joseph and John Freeman, Carter, Walker, Faulkner, Fallding, and Professor Williams.

The minutes of the last meeting were read and confirmed.

The Secretary read a letter from Mrs. Spooner, thanking the members for their expression of sympathy in her recent bereavement.

On the motion of the *President*, seconded by *Mr. Nicholson*, it was unanimously resolved that the Secretary write a letter of condolence to the widow of Mr. William Taylor, of Wetherby. The continuation of the discussion as to "the modes of transmission of infection" was resumed, most of the members present joining in the debate. At the conclusion a unanimous vote of thanks was awarded to Mr. Greaves for his kindness in bringing forward the subject.

A circular received from the North of England Society, desiring to know the opinion of the members upon four questions of veterinary politics, was read and discussed. The Secretary was requested to forward a copy of the conclusions which had been arrived at to Mr. Meikle.

The discussion upon Mr. Fearnley's paper was deferred until the summer meeting. (Signed) WILLIAM BROUGHTON,
Hon. Secretary.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE thirty-first quarterly meeting of the Association was held in the Medical Hall, Hope-street, on Friday evening, the 9th of February, 1872.

The chair was taken after tea by the President. Present—Messrs. Storrar, Fenny, Reynolds, Elam, J. and W. Leather, Littler, Wilson, Spearman, Welsby, Woods, Whittle, Cartwright, Lowe, Dobie, P. Ellis, Greaves, Ackroyd, G. Heyes, Leyland, and the Secretary. Letters of apology were read from Messrs. Barnes, T. Taylor, T. D. Broad, C. Dayus, Carless, and Darwell.

Mr. Storrar proposed, and *Mr. Reynolds* seconded, Mr. Leather, jun., as a member, which was unanimously carried.

Mr. Storrar proposed, and *Mr. Lawson* seconded, Mr. T. Littler, as a member, which was likewise carried.

Mr. P. Ellis then read his paper on "Parturient Apoplexy," which was productive of a very lively discussion, in which nearly all present joined. The most opposite opinions were held as to the pathology, nature, and treatment of the disease.

After votes of thanks had been accorded to the essayist and chairman, the meeting terminated at an early hour.

WILLIAM C. LAWSON,
Hon. Secretary.

GLASGOW VETERINARY COLLEGE.

PRESENTATIONS TO PROFESSORS M'CALL AND FORDIE.

The students attending this Institution during last winter session assembled in the class-room at the conclusion of the lectures, and presented the Principal, Professor McCall, with an elaborately written address, and also Professor Fordie with a handsome diamond ring and gold breast-pin.

The students, Messrs. Millar and Crawford, who presented these testimonials, respectively spoke in high terms of the manner in which the classes had been conducted throughout the session; of the attention that had been bestowed on them by the different teachers, and, more especially, of the great care that had been taken to render them scientific and successful veterinary surgeons.

MEMORIAL TO THE LATE ALDERMAN W. ROBINSON.

A public meeting, presided over by the Mayor (Mr. Edwin Hooper), has just been held in the Town Hall, Tamworth, for the purpose of considering the desirability of erecting a suitable memorial to the late Alderman William Robinson, and to take such steps as might be necessary to carry out that object. Amongst those present were Mr. R. W. Handbury, M.P., and Messrs. J. Shaw, M. Madan, Brown, W. Desber, J. Hill, S. Arnold, W. Arnold, W. Hand, W. Tempest, E. Lowe, T. Argyle, H. Hare, J. W. Pemberton, R. W. Nevill (Town Clerk), W. Lucy, M. G. Atkins, W. Bindley, J. P. Elliott, S. Barraclough, W. Wileman, Burley, T. B. Allkins, A. Clarson, Morrall, &c. The Mayor read letters of apology from Mr. Evans (Derby), Mr. Mayou, Mr. Skey, Mr. Mallaby, and Mr. Woody.

Mr. Burley, veterinary surgeon, of Leicester, moved the first resolution, "That it is desirable that a suitable memorial be erected to the late Mr. Robinson, and that a subscription be entered into for that purpose." Mr. Burley traced Mr. Robinson's career for the last 60 years, during which long time they, as fellow professional men, had been intimately acquainted. After referring to the deceased's many amiable and sterling qualities, both as a business man and a gentleman, the speaker expressed

his surprise at the absence of the members of the veterinary profession on that occasion. It was, he thought, unpardonable, when they considered that Mr. Robinson had proved himself an ornament to the profession, and the time and talent he had bestowed in raising it to a higher standard, as also the services rendered by him as President and a member of the Board of Examiners to the Royal College of Veterinary Surgeons in London. Mr. Burley referred to Mr. Robinson's abstemious habits, which had enabled him to live to a ripe old age, but regretted that their friend had at last died a poor man, in harness, caused principally by his performing a great amount of his practice gratuitously. He did not believe in that system, and in his (Mr. Burley's) career he had always looked after "number one"—(laughter). He believed the memory of no man that ever lived deserved more honour than his late friend Mr. Robinson's, and it was with the greatest pleasure he moved the resolution entrusted to him—(applause.)

Mr. M. Madan seconded the resolution, which was carried.

Mr. Shaw then proposed a committee of several noblemen and members of Parliament, with power to add to their number, to co-operate with the Local Committee already formed.

Mr. Argyle seconded the resolution, which was carried.

In a discussion that followed, it transpired that the form of the memorial had not been decided upon, but the feeling of the meeting appeared to be against the founding of a scholarship or its taking any shape that would remove it from Tamworth.

The Mayor, the Town Clerk, and Mr. Shaw were elected secretaries; and the National Provincial Bank and Lloyds' Banking Company were requested to act as treasurers.

The meeting closed with a vote of thanks to the chairman.

From the high estimation in which Mr. Robinson was held, both in Tamworth and throughout the country, it is expected the Memorial Fund will reach a very large amount.

Veterinary Jurisprudence.

IMPORTANT TO FARMERS AND DAIRYMEN.
"OVERSTOCKING" COWS.

At the Leeds Town Hall, May 3rd, before Mr. Bruce and Mr. S. Hey, a case largely affecting the cattle and dairy trades was heard, on remand from the 19th ult. The local officer of the Royal

Society for the Prevention of Cruelty to Animals (Inspector Peet) summoned Benjamin Walker, farmer, Killingbeck; Wm. D. Goodall, farmer, Roundhay; William Hackney, cowkeeper, New Leeds; and Wm. Wilson, farmer, Scholes; for cruelty to animals. The specific nature of the charges was that, on the 9th ult., cows owned by the defendants, and exposed for sale in Leeds Smithfield Market, were left unmilked, or "overstocked," by which the udder, becoming largely distended, inflicted great pain upon the animals. Mr. Brumby, barrister-at-law, appeared on behalf of the society, and Mr. Ferns for the defendants. At the outset it was decided to take the case against the defendant Hackney, and at the close of the case the Bench remarking that as it was the custom of overstocking cows against which the society was proceeding, the decision in this case would rule the remainder.

Mr. Brumby said that the case which he had to bring before the court was one resulting from a practice that had been for some time very frequently carried on in Leeds—viz. that of sending cows to the cattle market in a state in which they ought not to be sent. The breeders or salesmen of the cattle, when sending a cow to the market, were in the habit of not milking it. The reason of this was that by so doing the udder became unnaturally swollen, and gave a fictitious appearance to the cows. They looked as being much more rich in milk than they actually were, and, as a consequence, stood a better chance of obtaining a good price. Instead of being milked at the end of twelve hours, the cows, when taken to market, were driven to Leeds with their udders filled, and suffering intense pain and agony. On the 9th of April, about mid-day, the defendant Hackney was driving a cow along the road from the market in the direction of Chapeltown. The animal was seen by the officer of the society, and also two experienced veterinary surgeons, who would describe its pitiful condition. If the cow suffered from its udder being surcharged with milk, it must follow of necessity that the pain and suffering would be much increased when the animal came to be driven along the road. An animal like the cow, from the nature of its physical organization, when driven in such a state, must suffer intensely. He would call as witnesses gentlemen not only well known in the veterinary art, but also others who had made the science of comparative anatomy their special study, and who were in a position at any time to take up their status as surgeons. The poor cow driven by Hackney was walking with great difficulty when the officers saw it. The udder was distended, the milk was spirting out of the teats at each step, from the nostrils ropy mucus was issuing, and upon thermometrical observations being made of the body the beast was found to be in a state of irritative fever. The normal heat of an animal ranged from 98 to about 100, but in this case the thermometer indicated 104 degrees. The milk taken from the udder was so bad as to be totally unfit for human consumption. If the custom of thus "overstocking" cows when exposed for sale in the market had been one of long practice in Leeds, the sooner it was remedied the better.

Inspector Peet, of the Royal Society for the Prevention of Cruelty to Animals, stated that, accompanied by Mr. Cherry, he saw the cow on the 9th ult. The defendant was driving it from the market in the direction of Sheepscar, and witness followed as far as Sheepscar Bar. He had previously asked the defendant to relieve the cow of some of its milk. The milk was streaming from the teats of the udder. The defendant said that he was not going to waste the milk, and they would have to wait until he got home. At Sheepscar Bar the cow was stopped and examined by the veterinary surgeons. The defendant told witness that he had bought the cow from Mr. Wilson in the market.

Mr. Fearnley, veterinary surgeon, Leeds, said that he accompanied Inspector Peet on the 9th ult., when they accosted the defendant. Witness examined the cow, and the thermometrical observations he made recorded the internal heat at 104 1-10th degrees. The breathing was rather more than twice what it ought to be; the pulse was quick; there were facial indications of great suffering; the udder was much distended, and the milk, which flowed continuously from the four teats, was thin and hot. The ordinary temperature of the body was 100 degrees. A temperature of 104 degrees was indicative of very high fever. The cow in the present case was suffering from irritative or sympathetic fever, brought on by accumulation of milk. Witness also detected a slight palpitation. The nerves of a cow were functionally the same as in a human subject. Cross-examined by *Mr. Ferns:* The udder was supported by an elastic tissue capable of considerable distension without causing pain. From six o'clock in the evening till noon the next day was an unreasonable time to allow a cow to go without milking. The milk retained so long was not fit for use.—*Mr. Ferns:* Do you not know that the distension of the udder is taken as exhibiting the milking capacities of the cow? *Witness:* Yes, it may be. The udder is made, as I said, of elastic tissue, and it will distend considerably. Over a certain amount the milk runs off.—*Mr. Ferns:* Do cows not shed their milk when the udder is even half full? *Witness:* They do not when healthy; if they do, they are out of health.

Mr. Cherry, veterinary surgeon, London, stated that he was present when Mr. Fearnley made the examination of the cow, and he concurred in the results defined by that gentleman. Witness tasted the milk, and it was brackish. In cross-examination, Mr. Cherry said that he would be surprised if it was proved to him as a common practice that a large number of cows shed their milk between meal times when regularly milked. In re-examination, the witness said that he had been sent to Leeds by the Society for the Prevention of Cruelty to Animals to examine into the state of many of the cows driven into Leeds market, in consequence of the numerous and repeated complaints made.

Mr. Ferguson, veterinary surgeon, Leeds, gave corroborative evidence with regard to the indication of high temperature in the body.

Dr. Allbutt, Leeds, said that he had heard the evidence given by the previous witnesses with regard to temperature, and they corresponded with what existed in the human subject in cases of fever. A temperature of 104 degrees indicated fever.

This concluded the case for the complainants.

Mr. Ferns, in addressing the Court for the defence, said that the decision was awaited with extreme anxiety by a large number of the most respectable and extensive farmers in Yorkshire. The defendant was charged in the summons with torturing the cow; that was to say, he did something which was an act of cruelty. He should prove, by the evidence of several experienced men, that it was actually dangerous to complete milking a cow before going to market if she had to be driven along the road. Cows were always half-milked under such circumstances lest they should take cold. The cow came into the possession of the defendant between ten and eleven o'clock on the morning of the 9th of April, and was relieved of some of its milk, after which it was taken out of the market. He maintained that the Society for the Prevention of Cruelty to Animals was going beyond its province in interfering with matters over which it was never intended that it should have control. A large number of witnesses were then called for the defence.

Mr. A. Hutchinson, cowkeeper, Headingley, said that he had kept cows for many years, and had now between 30 and 40. It was the custom to send cows to market with a meal's milk in the udder. Shedding milk was not an indication of overcharge of the udder.—Cross-examined by *Mr. Brumby*, witness stated that it was the practice to milk the cows at five o'clock in the evening, and in the morning at the same hour, but this was not done when cows were going to the market. The reason was that the milk in the udder distending it, exhibited the milking properties of the cow.

Mr. Wilson, Redcote, Armley; *Mr. Beaumont*, tenant-farmer, Templenewsam; *Mr. W. Reeves*, farmer, Scarcroft; and *William Allen*, in the employment of Mr. Wilson, corroborated the evidence of Mr. Hutchinson, as to the custom of sending cows to the market with the udder full, and that shedding milk was not an uncommon thing. The witness Allen stated that he relieved the cow of half a gallon of milk before it left the market.

Mr. John Faulkner, veterinary surgeon, Wetherby, did not think that the retention of a meal's milk was either detrimental or painful to the cow. He had seen a cow driven for some distance, although not milked for eighteen hours, and had also seen cows going along the road whilst the milk was spurting out of the teats of the udder.

Mr. Joseph Drake, cowkeeper, Leeds, said that he did not like to buy a cow with a little udder; they did not generally prove good milkers. He also preferred to see a cow shedding her milk, as she must be a free milker to do so.

Mr. Pogson, surgeon, Scarcroft, said that shedding would give relief as the udder filled.—*Mr. Thos. Dickson* and *Mr. Wm. Walker*, the latter gentleman a farmer at Shadwell, also stated that it was the common practice to send cows to the market with the udder filled.

This concluded the case, and the bench retired.

Mr. Bruce, on returning to Court, said that he had the great advantage of having the assistance on the bench of a gentleman much more skilled in matters relating to physiology than himself. They had come to the conclusion that they were not satisfied that the practice complained of caused such an amount of suffering to the animal subjected to it as to amount to cruelty.

Mr. Brumby asked if the Bench would grant a case. He understood the Court to rule that the practice of sending cattle to market without being milked at their proper time, and to allow them to remain until noon the next day without relief, was not cruelty.

Mr. Bruce said the Bench were not satisfied with the evidence before them. Was it not rather a question of fact than of law? If a case had to be stated it would only be necessary to send up the evidence. The decision in favour of the defendant went entirely upon the evidence adduced before the court.

The summons was accordingly dismissed.

Mr. Ferns applied for costs.

Mr. Bruce replied that the custom, spoken to throughout the case, appeared to have been of such long duration, according to the evidence for the defendant (and it had not been shaken), that even if the question had rested upon that ground he was not sure whether they could have found a man guilty of cruelty for pursuing a practice which had existed since the memory of man, and probably long before. Cruelty consisted in a man doing something recklessly or wilfully cruel; and a man could hardly be said to be doing what was recklessly and wilfully cruel when he was merely following a custom pursued in markets for years. The defendant would be allowed costs for the day.

The Court then rose after a sitting of six hours.—*Leeds Mercury.*

PLEURO-PNEUMONIA.

Mr. John Keene, a dairyman, in the Latymer Road, Hammersmith, was summoned, on April 26th, at the Hammersmith Police Court, by the Metropolitan Board of Works, under the Contagious Diseases (Animals) Act, for not giving notice to the police, with all practical speed, of the fact that his four cows were suffering from pleuro-pneumonia.

Mr. Fry appeared to support the summons, and referred the Magistrate to several clauses in the Act bearing upon the case. He said the defendant was liable to a penalty of £20, as his number of cows did not exceed four. Had there been more he would have been liable to a penalty of £5 for each.

Mr. Joseph Woodger, jun., veterinary surgeon, said he was the inspector appointed by the board for the district. On the 4th ult. he visited the defendant's premises and found three cows suffering from pleuro-pneumonia, and also the carcase of a cow which had been so affected. He asked the defendant how long the animals

had been affected, and he said he first noticed that they were ill on the 24th or 26th of February.

In reply to the defendant the witness said he gave every information, and behaved like an honest man.

The defendant said he had been in the trade for many years, and he always endeavoured to carry out the law. At the beginning of the year he and other cowkeepers understood that the orders had been withdrawn.

Mr. Fry said the former Orders in Council were withdrawn, but another was made in December, 1871.

Mr. Ingham said that, instead of fining the defendant £20, he would order him to pay 20*s.* and 12*s.* 6*d.* costs.

FOOT AND MOUTH DISEASE.

REGULATIONS FOR THE REMOVAL OF THE HEALTHY PORTION OF A CARGO OF FOREIGN SHEEP FROM THE PLACE OF IMPORT.

Foreign Sheep.

Application for Licence for Removal Inland for Slaughter.

The Local Authority of hereby apply to Her Majesty's Privy Council for a licence for removal inland for slaughter of Foreign Sheep, when certified by the Veterinary Inspector of the Privy Council to be free from contagious or infectious disease, notwithstanding that the same have been brought in the same vessel with any animal affected with foot-and-mouth disease.

The Local Authority desire that such removal should be licensed—

From the landing-place, at the Port of , in the of , to an inland slaughter-place, in the of , to be defined by the Privy Council, by the following Railway and route :

By the Railway,

The Local Authority desire that the inland slaughter-place should be defined as follows :

which space is coloured on the inclosed plan of

The Local Authority make this application on the understanding that the licence is to be subject to the conditions subjoined to this application, and they undertake that those conditions shall be faithfully observed on their part.

The Local Authority further undertake—

(*a*) To appoint , being a Member of the Royal College of Veterinary Surgeons, residing at , to be the Inspector, to superintend and be responsible for the execution of the conditions and of

the instructions of the Privy Council relating thereto, and to make such reports and returns as the Privy Council from time to time direct.

(*b*) To instruct their Constables and Police Officers to enforce the conditions, and to do and cause to be done all things from time to time necessary or proper for securing to the utmost practicable extent the effectual isolation of in respect of the movement of animals.

Dated this day of

By Order of the Local Authority,

The Railway Company hereby declare their concurrence in the foregoing application, and undertake that the subjoined conditions shall be faithfully observed on their part.

Dated this day of

By Order of the Directors of the above-named Railway Company, *Secretary.*

Conditions.

1. Sheep removed under the licence shall be removed to the inland slaughter-place defined, and not to any other place, for the purpose of being slaughtered in the inland slaughter-place, and for no other purpose by the prescribed Railway and route, and not otherwise.

2. They shall be moved, without stopping, in trucks appropriated for conveyance of foreign sheep under the licence, and distinguished as so appropriated by a red stripe two feet wide painted all round each truck.

3. The trucks so appropriated and distinguished shall not be at any time used for any purpose other than the carrying of sheep under the licence.

4. A truck in which sheep have been carried under the licence, shall not be moved out of the inland slaughter-place until it has been cleansed and disinfected in manner prescribed by Article 17 of The Animals Order of 1871.

5. Sheep carried under the licence shall be discharged from the trucks within the inland slaughter-place, and not elsewhere.

6. The following regulations shall apply to the inland slaughter-place:

(*a*) No animal (as defined in The Contagious Diseases (Animals) Act, 1869) shall be removed therefrom alive.

(*b*) Sheep removed under the licence shall be slaughtered therein within ten days after the day of landing, exclusive of the day of landing.

(*c*) No carcase, hide, meat, or offal, and no hay, straw, litter, or other thing commonly used for food of animals, or otherwise for or about animals, and no dung, shall be removed therefrom, except with the permission of the Inspector, and, if the Inspector is of opinion that any such carcase or thing as aforesaid may convey any

contagious or infectious disease, the same shall be dealt with in accordance with the instructions from time to time given by the Privy Council.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF COMMONS—*Monday, May* 13.

DISEASED SHEEP AND CATTLE.

MR. J. B. SMITH (for Mr. Jacob Bright) asked the Vice-President of the Council whether, in consequence of the agricultural returns, which showed a great decrease in sheep and cattle, and the high price of meat resulting therefrom, he would reconsider the Order in Council of December 20th, 1871, with the view of allowing imported sheep to pass to the inland towns when free from disease; and whether Prussia might not, in regard to horned cattle, be put in the same position as Spain, Holland, Norway, and Sweden.

Mr. W. E. FORSTER replied that the instructions issued under the order in question provided for the slaughter at the port of landing of all sheep in case any of the cargo had the foot and mouth disease; and the Government did not feel that they could depart from that order. (Hear, hear.) A very important deputation which had waited upon him from the northern towns had complained of the effect of that order, stating that it caused a very large number of sheep to be slaughtered. He might observe that the total number of sheep imported had not been diminished by this regulation. The total import of sheep into Great Britain for the first quarter of the year from the Continent was about 123,000, as against 64,000 for the first quarter of last year. It was true that there had been a smaller import into the northern towns in proportion than there had been into London, and the reason of that was, that there had been much more disease amongst the sheep which came into the north. Only six per cent. of the ships which came into London had diseased animals on board, whereas in the case of Hull and several other of the northern towns the percentage was 46. This was owing, he believed, to greater care being taken in London with regard to having ships free from infection, and also with regard to the selection of the animals. It was stated by the deputation that the inspection was more severe and stringent in the north than in London, but this, he believed, was not the case. He had ascertained that the regulations were precisely the same in London and the north. It had also been stated that several sheep had been slaughtered which had not the foot and mouth disease, but were merely footsore. From inquiries that had been made he was satisfied that that statement was without foundation. Very strong recommendations had been made to Government to allow sheep to proceed from the port of landing to inland towns under

restrictions. He considered that these restrictions would be exceedingly difficult, but was prepared to try the experiment. The restrictions could not be otherwise than onerous in order to be safe. The local authorities of the large inland towns would be informed that if they chose to make application for it, a licence would be granted for the transport of the sheep. With regard to the second question, he had to say that it would be quite impossible to allow the relaxation asked for with any safety. (Hear, hear.)

THE NEW PRESIDENT AND VICE-PRESIDENTS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

At a Special Meeting of the Council of the College held on Tuesday, May 28th, J. M. Harpley, Esq., V.S., Royal Horse Guards, was elected *President*, and the following gentlemen were also elected *Vice-Presidents* for the ensuing year:—Lieut.-Col. Fitzwygram, Messrs. J. R. Cox, C. Lowe, T. W. Mayer, M. E. Naylor, and A. J. Owles.

Mr. W. H. Coates was re-elected Secretary.

ROYAL VETERINARY COLLEGE—MONITORS.

The following gentlemen have been chosen, on a competitive examination, as Monitors during the summer session at the Royal Veterinary College:—Messrs. F. Case, J. G. Cross, T. Goodall, W. T. Kendall, S. Longhurst, and A. H. Thomas.

MATRICULATION EXAMINATION.

The following gentlemen have passed their Matriculation Examination, and entered on their studies at the Royal Veterinary College:—Messrs. A. Drake, Glasgow; F. Young, Malvern; T. Stainton, Horncastle.

OBITUARY.

On the 19th of May, Mr. Richard Lord, M.R.C.V.S., Halifax, Yorkshire, in the 39th year of his age. His diploma bears date November 16th, 1866. Mr. Lord also held the certificate of the Highland and Agricultural Society, bearing date April 23rd, 1857.

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Communications and Cases.

ON A RACE OF HORSES WITH THIRTY-FOUR RIBS.

By G. Fleming, M.R.C.V.S., Royal Engineers.

For a number of years much attention has been paid to the history of the most useful of all the domesticated animals, the horse, and the sciences of anatomy and palæontology have been brought to bear in attempts to elucidate its origin from one or more sources, as well as in tracing its gradation in type from extinct species. Not long ago a distinguished French veterinarian, M. Sanson, successfully proved that the pure bred Arab horse was specifically distinct in its anatomical characteristics from other horses, the principal differential feature consisting in the presence of only *five* lumbar vertebræ. We know that in the ass, and sometimes also in the mule, this is the usual number, and that *six* is the rule in the horse; though rarely *seven* have been noted, with the ordinary complement in the other regions. And it has also been remarked that there are sometimes nineteen dorsal vertebræ, with an equal number of ribs; but that in these instances there are only five lumbar pieces. M. Sanson has endeavoured to establish the fact, that in the typical Arab horse there is the usual instalment of cervical and dorsal vertebræ and ribs, but only the five bones in the lumbar region.*

In one of the most remarkable and learned works ever devoted to the history of the horse,† whether considered from a

* "Memoir sur une Nouvelle Determination d'un Type Spécific de Race Chevaline à Cinq Vertèbres Lombaires," 'Journal de l'Anatomie et de la Physiologie,' May, 1868.

† 'Les Origines du Cheval Domestique.' Paris, 1870.

palæontological, zoological, historical, or philological point of view, M. Piétrement, a talented veterinary surgeon in the French army, has called attention to a striking passage in that most ancient of all books that have come down to our days, the 'Hindoo Riga-Vêda.' From this passage it would appear that a race of horses, known to the Aryans, utilised by them for drawing chariots and offered up as sacrifices to their gods, had only *thirty-four* ribs.

M. Piétrement says:—"From amongst the large number of hymns in the 'Riga-Vêda,' which might furnish proofs with regard to the antiquity of employing the horse, we have chosen the preceding quotations, because they give, in addition, some interesting information as to the physical and moral qualities of the horses of the Vêdic Aryans, and also because the hymn of Açvamêdha even mention the remarkable fact of the normal existence of only *thirty-four* ribs in these horses, while ours usually have thirty-six, and sometimes thirty-eight."*

The novelty of this statement, and the improbability of its correctness, together with the usual amount of uncertainty that always attaches to ancient records that have come down to us through frequent transcription, gave rise to some discussion, which has resulted in proving, philologically, the correctness of the fact enunciated by Piétrement. No less an authority than Max Müller, the learned Professor of Comparative Philology in the University of Oxford, and who has given a translation from Sanskrit of the 'Riga-Vêda, has testified to the exactness of the quotation. In a letter to Piétrement he writes:—"You will find the translation of the whole hymn from which the verse is taken in my 'History of Ancient Sanskrit Literature,' pp. 553, 556. I translate the verse 18: 'The axe approaches the 34 ribs of the quick horse, beloved of the gods.' The Latin translation would be: 'iv et xxx fortis deorum-amici costas equi securis percurrit.'

"The 'Commentary of Sâyana' is written in Sanskrit, and contains the old traditional explanation of the 'Vêda.' But Sâyana himself lived about A.D. 1400. In our passage he says: 'Other animals, goats and the like, have only 26 vankri, as appears from the liturgical rule, "there are 26 ribs."'" Now, this liturgical formula (*praisha*) is taken from the 'Aitareya-brâhmana' (11, 6), an old work, written in Archaic Sanskrit, not later than B.C. 500. The subject is certainly curious, and deserves further consideration. The Hindoos were in the habit of counting the bones of the body.

* 'Les Origines du Cheval Domestiques.'

There is a curious passage on that subject in the 'Laws of Yâgnavalkya,' book iii, p. 85, *et seq.* See 'Yâgnavalkya, edit. Stenzler, text and German translation."

There can scarcely, then, remain a doubt as to the existence of horses to the north of the Himalayas possessing only this small number of ribs; for though, at the very distant period at which these hymns were composed, a knowledge of anatomy must have been very rudimentary, yet for religious purposes a certain amount was necessary, particularly with regard to the osteology of the different animals offered up for sacrifice.

The author of the hymn in question, Dirghatamas, like all the other authors of the hymns which constitute the 'Riga-Vêda,' was at the same time poet, priest, and sacrificer; he belonged, in fact, to the lettered class, which at that time was the only one that studied science. True, the attention of the early Aryans was chiefly devoted to celestial phenomena, and with these their oblations and sacrifices were closely related; so that their ideas of anatomy may have been extremely limited. But still, a knowledge of the number of bones possessed by the different animals so immolated must have been necessary to a Hindoo priest who had to conduct the rites of such an important religious ceremony as that of the Açvamêdha. The very ancient documents just cited prove that among the Hindoos this kind of practical anatomy was studied, and that the number of bones, and especially the ribs, was known at the very earliest epoch. Thus, in addition to the mention of thirty-four ribs in the horse, we find that twenty-six is the number correctly given for the cow, sheep, dog, and cat. It is impossible that Dirghatamas could have erred in his enumeration of the horse's ribs, for this animal was constantly offered as a sacrifice, and a misreckoning would readily have been perceived by his colleagues or the spectators who witnessed these sacrifices. Besides, these hymns have passed through the hands of several early commentators, who, being Hindoos and priests, would undoubtedly have indicated the mistake had it existed. That the number thirty-four has not been inserted instead of thirty-six by these commentators and copyists, is proved by the circumstance that the Sanskrit for thirty-four rhymes with, and is the complementary measure to, the subsequent lines, while thirty-six does not at all accord.

In confirmation of the statement that certain Asiatic peoples have been in the habit of counting the number of bones in the animals they killed, it is curious to find Huc alluding to such a practice as prevalent among the priests of the nomadic Mongols of Chinese Tartary so late as 1844. Travelling

among the Ortous, the Abbé and his companions were invited to dine off a sheep by a young Lama priest. "After dinner," he says, "every one having thoroughly regaled, our neighbours took their kitchen utensils and returned home, except the young Lama, who said he would not leave us alone. After much talk about the east and the west, he took down the skeleton of the sheep, which had been hung up in the tent, and amused himself with reciting, or rather singing, the nomenclature of all bones, large and small, that compose the frame of the sheep. He perceived that our knowledge on this subject was very limited, and this astonished him extremely. We had the greatest difficulty in making him understand that in our country ecclesiastical studies had for their object more serious and important matters than the names and number of the bones of a sheep. Every Mongol knows the number, name, and position of the bones which compose the frame of animals, and thus they never break the bones when they are cutting up an ox or a sheep. With the point of their large knife they go straight and at once to the juncture of the bones, separating them with astonishing skill and celerity." *

The probable date at which Dirghatamas sung of "the thirty-four ribs of the quick horse" is lost in the haze of obscurity; the most moderate estimate would place it at between three or four thousand years ago. It has been stated that the Vêdas, of which the Açvamêdha is one, were written or inscribed fourteen hundred years before our era; and it is easy to see that they were a collection of compositions much more ancient than that age.

On philological evidence alone, then, it is demonstrated that a primitive people, the Aryans of the Vedic age, inhabiting Central Asia, were accustomed, from time immemorial, to count and designate the bones of animals, and that one of their poet-priests has formally affirmed, in a sacred hymn, the existence of only thirty-four ribs in the horses of that region and age.

It may be also stated that this zoological fact is quite admissible, because it is analogous to others already known to science; the number of ribs mentioned by this ancient priest cannot in any way be the result of insufficiency of anatomical knowledge nor of an error on his part, or yet of his copyists, for, in addition to corroborative evidence in the hymn itself, the statement is confirmed by a subsequent commentator.

It would appear from the able researches of M. Piétrement,

* 'Souvenirs d'un Voyage dans la Tartarie et le Thibet, pendant les Années, 1844, 1845, and 1846.' By M. Huc. Paris, 1868, vol. i, p. 340.

that the ancestors of these horses were originally domesticated in their native country, between the Himalaya and the Altai mountains, by the primitive Aryans before their dispersion, and anterior to the Vêdic age. Does this race of thirty-four-ribbed horses still exist? or has crossing and intercrossing with other races of different origin effaced this peculiarity? The solution of these questions would prove of the highest interest to the zoologist, comparative anatomist, and others; though it need not be attempted in India, but to the north of the Himalayas, the birthplace of our civilisation.

It is to be presumed that the thirty-four ribs would be accompanied by a corresponding number of dorsal vertebræ —seventeen, or one less than we now find, and consequently that the number of lumbar would be six at least; for if the Aryan horses were like the typical African horses in possessing only five lumbar vertebræ, the extraordinary deficiency of two pieces in the dorso-lumbar stalk would surely prove a serious deformity, unless accompanied by corresponding anomalies in the limbs.

As the matter now stands, it would appear that Central Asia was the zoological centre for a breed of horses possessing only thirty-four ribs, and Africa was another centre for an equine race furnished with five instead of six lumbar vertebræ; while in other regions the normal number of ribs observed has been thirty-six, with six lumbar vertebræ.

"JUSTICES' JUSTICE."

By Thomas Walley, Professor at the Edinburgh Veterinary College.

These two words, which of late have become very common in the mouths of Englishmen, have not been shorn of any of their sarcasm by the decision of the Leeds magistrates in the prosecution (as reported in your last number) for "over-stocking" cows' udders.

If ever professional evidence was set aside in favour of old-established custom, it was in this case. The practice of "hefting" in Scotland—to which I called the attention of the Royal Society for the Prevention of Cruelty to Animals in the *Animal World* for May—is so intimately connected with that of "over-stocking," that I consider it the duty of veterinary surgeons (if they would deserve the title of being humane) to do all in their power to put down these disgraceful prac-

tices, which long since should have been registered as relics of the dark ages that are gone by.

We cannot ask the poor animals that are made the subjects of "over-stocking," Do you suffer pain? but we can, analogically, ask the question of any woman suckling a child, when from cracked teats, or other cause, she is compelled to allow the milk to accumulate in her breasts; and the answer will not be an uncertain one. Could the Leeds magistrates be subjected to such a process, I imagine they would alter their verdict as to the non-cruelty of "over-stocking" cows' udders. Mr. Fearnley's evidence, though very good and true, was not nearly so strong as it might have been.

Would it be out of the province of the various associations to send a conjoint memorial on the subject to the Privy Council, or other proper authority?

Turning from the conclusions of the Leeds magistrates, allow me to call the attention of the profession to the following—in my opinion—somewhat novel case, in which a higher authority than that above referred to, viz., "the Master of the Rolls," did not ignore veterinary evidence.

The action, G— against F—, was to compel the defendant, a manufacturer, to remove a certain engine which he had erected, without consent, so close to the foundation of the plaintiff's stable as to produce:—1. In the floor of the said stable a constant vibration, thereby engendering a tremulous and uncertain motion in the legs of the animals compelled to submit to its influence, thus rendering them unsafe for either riding or driving purposes. 2. The buzz of the engine further reduced the value of the stable as a resting place for strange horses, as it was found that well-bred horses would not enter the stable whilst the engine was at work, and if they were coaxed to do so, had to be narrowly watched to prevent them injuring themselves. 3. A strong smell from the oil of the engine, produced by the constant friction, permeated the stable, thus producing nausea in animals placed there to feed.

In order to settle this matter a veterinary surgeon in the town in which the scene of the action-at-law lay was called in, and gave an opinion favorable to the plaintiff. Subsequently he withdrew from the case, and I was desired to investigate the matter, and report upon the true state of affairs.

To this end I devoted some time and attention, and after consulting with several of my professional brethren in Manchester, I gave a certificate in almost similar terms on the three points, as above mentioned.

The case, having been brought before the Master of the Rolls, was decided in favour of the plaintiff, the defendant being mulcted in damages to the stable and premises by way of compensation, to be assessed by a competent person, and the payment of the costs of the suit.

This verdict does not satisfy the plaintiff, absolute removal of the nuisance being sought; but this does not set aside the value of the veterinary evidence, which I conceive was the most important in the whole case.

I may add that a relative of the plaintiff was the first to discover the fact that the horses were fast becoming unsafe on their legs, and very excitable and unmanageable.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 409.)

The natural order—Moraceæ, Morads, includes three genera of great importance, namely:

Morus—Mulberries.
Ficus—Figs and cow-trees.
Dorstenia—Contrayerva.

The diagnosis of the order, according to Lindley, is as follows:

"*Urtical exogens with solitary suspended ovules, and a hooked albuminous embryo with a superior radicle.*"

The fact that plants with fruits so apparently different as the three we are about to describe should belong to the same natural order is calculated at first to puzzle the student of botany.

But if we examine even the fruits, the mulberry, the fig, and the contrayerva, carefully, we shall soon find that their differences are really more apparent than real; thus the mulberry has its *Acheniæ* arranged on a conical receptacle, the contrayerva a flattened one, and the fig is, after all, only a receptacle, with, as it were, the apex compressed until it becomes pushed inwards—the interior of the fig being filled up with flowers and fruits, while the fleshy part of the so-called fruit is only the inverted receptacle. But it is, after all,

to the structure of the seeds and the general habits of the plants that we must look for our true analogues.

As a rule the Moraceæ discharge a milky juice from their leaves; so much so that some of the Ficus plants get the name of cow-trees. These juices are very variable, in some very sweet and wholesome, while in others they partake of that acridity which, indeed, belongs to the family.

Morus nigra—mulberry—is a well-known tree, which assumes considerable dimensions even in this country, where there are few old mansions to which this native of Persia has not been brought. The tree is slow of growth, but seems to possess a strength of constitution that enables it to reach to an age of centuries.

It is grown much in France as food for silkworms; but in this country the sub-acid fruit seems to have caused its being planted, as the "berry" was at one time highly esteemed, for, as stated by Dr. Pereira—

"Mulberries are alimentary in a slight degree; they allay thirst, diminish febrile heat, and in large quantities prove laxative.

"They are employed as an agreeable aliment, and are well adapted to check preternatural heat and relieve thirst in fevers, but are objectionable when a tendency to diarrhœa exists. They owe their retention in the pharmacopœia to their colour and flavour."

Alas! for this want of faith in the mulberry. Formerly careful housewives considered themselves safe from many of the "ills that flesh is heir to" if they had some fresh mulberries at hand to allay all febrile symptoms, and, wanting this, the syrup of mulberries was one of the most necessary articles of the still-room.

In the palmy days of medicine, when the fashionable apothecary sent from four to six draughts, as a twenty-four hours' supply to some nervous spinster, syrup of mulberries was much resorted to, and the cures it wrought, when the medical man was an agreeable, chatty gossip, were very remarkable, and tended much to show that homœopathic treatment is not altogether so new as it professes to be. The same remarks apply to the *Dorstenia*, *Contrayerva*, or *Contrajerva*, and *D. Brasiliensis*, the root of which was formerly held in great repute as a diaphoretic and stimulant, but is now obsolete. Still the plant is welcome to the botanist for the interesting structure of its receptacle.

Ficus carica—fig—has flowers, both male and female, so remarkably in plan like those of the Dorstenia, that we can have no doubt of their relationship to each other; and, in

fact, the receptacle of Dorstenia would be a fig were its sides a little more enclosed, whilst the fig is a receptacle of the Dorstenia, with flowers in the interior of the so-called fruit.

Figs as a fruit are well known. In the south of England they usually ripen in the open air, under a warm wall, and in the vernacular of Dorset are known as "dofigs," which, perhaps, is but a corruption of out-o'-door figs.

Figs still hold the position in domestic medicine that they did in the days of Hezekiah, as much as six centuries before the Christian era:

"For Isaiah had said, Let them take a lump of figs and lay it for a plaster upon a boil, and he shall recover" (Isaiah xxxviii, 21).

And again:

"And Isaiah said, Take a lump of figs; and they took and laid it on the boil, and he recovered" (2 Kings xx, 7).

Thus, it is used at the present day as a discutient for boils, and, like roasted onion, for ear-ache, gum-boils, &c.

In the 'Materia Medica' of Pereira figs are described as "nutritive, emollient, demulcent, and laxative. In a fresh state they are both agreeable and wholesome; when dried, as we receive them, they readily disorder the stomach and bowels, and occasion flatulence, griping, and mild diarrhœa."

It is, doubtless, on these conditions that figs are made to form part of the Confectio Senna of the London Pharmacopœia.

But whatever medicinal properties figs possess, we may conclude they must be of the mildest, when this fruit, where it abounds, is a common article of food, and even with ourselves preserved figs are a most welcome and wholesome addition to the winter dessert.

We have only now, in completion of this alliance, to notice the ARTOCARPACEÆ, *Artocarpuds*, and PLATANACEÆ, *Planes*. These fortunately present little difficulties, and as they possess no extraordinary features, will not long detain us in their description.

The Artocarpads still afford that milky juice so characteristic of the alliance as well exhibited in the *A. incisa*, or bread-fruit tree of the tropics. But while the bread-fruit is wholesome from a large quantity of starch in its fruit, some of the species are considered as poisonous; of these the upas-tree of Java has been much commented upon. Professor Lindley says of it:—The venom of the Antjar poison (*Antiaris toxicaria*) is due to the presence of that most

deadly substance, strychnia. Notwithstanding the exaggerated statements that have been made regarding this tree, the upas of the Javenese, there remains no doubt that it is a plant of extreme virulence, even linen fabricated from its tough fibre being so acrid as to verify the story of the shirt of Nessus, for it excites the most distressing itching if insufficiently prepared."

Still the seeds are always wholesome, and the milky juices of some of the order point to caoutchouc as a product, and india rubber is actually made from some of the species as silk is elaborated from others.

Professor Lindley gives us so curious a history of the *Antiaris* that we cannot forbear to quote it from the 'Vegetable Kingdom.' He says:

"From a species of Antiaris (called by Mr. Nimmo *Lepurandra saccidora*) sacks are made in Western India by the following singular process:—'A branch is cut corresponding to the length and diameter of the sack wanted. It is soaked a little, and then beaten with clubs till the fibre separates from the wood. This done, the sack formed of the bark is turned inside out, and pulled down till the wood is sawed off, with the exception of a small piece left to form the bottom of the sack.'"

The *Brosimum* grows to a fine tree, and, as remarked by Scomburgh, it is so hard that it can only be felled by the American axe. This wood is the famous snake-wood, so named from its curious markings.

The PLATANACEÆ, *Planes*, are well known in this country from the fine examples of it which grow about London. It would seem that no tree withstands the smoke and other atmospheric taints of large cities like the plane. It grows to a great height and size, and is always graceful in outline—a charm which is contributed to by its fine foliage.

Of the planes we possess two forms—the *Platanus occidentalis*, the western plane, and *P. orientalis*, the eastern plane.

In the former the leaves are lobate, in the latter the divisions are so deep as to be called palmate. They are probably not specifically distinct, or, if so, seem to approach each other by insensible gradations. Evelyn, in his 'Silva,' gives us the following quaint account of the genus:

"PLATANUS.—This beautiful and precious tree, anciently sacred to Helena (and with which she crowned the Lar and Genius of the place), was so doated on by Xerxes, that Ælian and other authors tell us he made a halt and stopped his prodigious army of seventeen hundred thousand soldiers,

which even covered the sea, exhausted rivers, and thrust Mount Athos from the Continent, to admire the pülchritude and processity of one of them, and became so fond of it that, spoiling both himself, his concubines, and great persons of all their jewels, he covered it with gold, gems, necklaces, scarfs, and bracelets, and infinite riches; in fact was so enamoured of it, that for some days neither the concernment of his grand expedition or interest of honour, nor the necessary motion of his portentous army, could persuade him from it. He styled it his mistress, his minion, his goddess, and when he was forced to part from it, he caused the figure of it to be stamped on a medal of gold, which he continually wore about him. Wherever they built their sumptuous and magnificent colleges for the exercise of youth in gymnastics, as riding, wrestling, running, leaping, throwing the discus, &c., and where the graver philosophers also met to converse together and improve their studies, he planted walks of *platans* to refresh and shade the palæstrita, as you have them described by Vitruvius (Lib. v, cap. 11), and as Claudius Perrault has assisted the text with a figure or ichnographical plot. These trees the Romans first brought out of the Levant and cultivated with so much industry and cost for their stately and proud heads only, that the great orators and statesmen, Cicero and Hortensius, would exchange now and then a turn at the bar, that they might have the pleasure to step to their villas and refresh their *platans*, which they would often irrigate with wine instead of water: *Credit et affuso latior umbra mero.* And so prized was the very shade of this tree, that when afterwards they transplanted it into France they exacted a solarium, by way of tribute, of any of the natives who should presume but to put his head under it. Whether for any extraordinary virtue in the shade or other propitious influence issuing from the tree, a worthy knight, who staid at Ispahan, in Persia, when that famous city was infected with a raging pestilence, told me that since they have planted a greater number of these noble trees about it, the plague has not come nigh their dwellings. Pliny affirms there is no tree whatsoever that so well defends us from the heat of the sun in summer, nor that admits it more kindly in winter. And for our encouragement I do upon experience assure you that they will flourish and abide with us without any more trouble than a frequent and plentiful watering, which from their youth they excessively delight in and gratefully acknowledge by their growth accordingly, so as I am persuaded that with very ordinary industry they might be propagated to the incredible ornament, walks, and avenues

to great men's houses. The introduction of this true plane among us is, perhaps, due to the great Lord Chancellor Bacon, who planted those (still flourishing ones) at Verulum. As to mine, I owe it to that honorable gentleman, the late Sir George Crook, of Oxfordshire, from whose bounty a hopeful plant is now growing in my villa" ('Silva,' pp. 58—62).

So much for Evelyn's quaint and verbose description of the plane, which, after all, is sufficient to show us the esteem in which this grand tree has so long been held.

We have, then, in the whole of this alliance an assemblage of most curious and interesting herbaceous plants, shrubs, and even mighty forest trees, all of which are of value in some way or another, but few of which can be considered as of medicinal or even dietetic importance. Still their connection with the plants which surround them, and their diversity in external structure and wonderful agreement in important minutiæ, are such as to recommend them to most attentive study.

In the next *Euphorbiales* we shall have to consider plants less obtrusive for grandeur, but more important in a medicinal point of view.

STRICTURE OF THE DUODENUM OF A COW.

By Jeffery Barton, V.S., Dover.

About ten months since I was sent for to attend a cow, seven years old, the property of E. P. Robinson, Esq., Farthingloe Farm, near Dover.

I found constipation of the bowels to exist, accompanied with slight abdominal pains, and also at intervals with tympanitis. The animal was continually moaning.

Diagnosis.—Impaction of food in the omasum. The usual remedies were had recourse to, and in a few days, to all appearance, the cow was well. She voided her fæces as usual, but the moaning continued up to December 30th, 1871, when she was killed.

On the 12th of this month I was again applied to, the man saying the cow was suffering just as she did before, and that her illness had been coming on some time. On my arrival I found the symptoms much the same as on the former occasion. Similar treatment was adopted and persevered in, but without any benefit.

My partner (who had also seen the case with me on this

occasion) agreed in the recommendation to have the animal killed, which the owner consented to. The *post-mortem* examination brought to light the following lesions:—Rumen distended to its utmost with ingesta; the reticulum and omasum also. The abomasum was likewise very full of digested food, among which traces of the medicine that had been given her could be detected. On following the course of the duodenum for about ten inches the mystery was unfolded. Here the intestine showed good evidence of having been twisted (no doubt at the time of the first attack), and although it had relieved itself again, the inflammation which succeeded had caused a gradual thickening of its coats and diminution of its calibre to such an extent that I could not force the tip of my little finger through the passage.

Anteriorly to the stricture the intestine was filled with fluid and ingesta, but behind the obstruction only a few masses of alimentary matter were found.

AN OBSCENE CAUSE OF FRACTURED LIMBS IN LAMBS.

By J. W. Axe, Assistant-Professor Royal Veterinary College.

On the 8th of June we were consulted by Mr. Hawtree, one of the inspectors of the Essex Constabulary, respecting a flock of lambs, the property of John Page, Esq., of Foulness Island, many of which had shown signs of sudden and intense lameness, which in numerous instances was found to be associated with fracture of the humerus. The animals were located on pasture land partially surrounded by sea walls about ten feet high, having a considerable slope inland. It appears that about three weeks prior to our being consulted the lambs were turned upon the pasture in company with an entire donkey, and in the course of two or three days several of them were observed to be lame, some so much so as to be quite incapable of walking. Every available means were adopted to determine the cause giving rise to the mischief. The sheep were regularly shepherded, and subsequently continuously watched.

Foul play being suspected, the police authorities were communicated with, and Inspector Hawtree visited the place, and remained there for a fortnight, during which time fresh cases

continued to appear, and the mischief remained unabated. Some suspicion being attached to the entire donkey, he was removed, we are informed, from the pasture, while at the same time a strict watch was kept over the flock, but still, in the absence of the donkey and with the exercise of the most scrupulous care, case after case occurred until upwards of seventeen lambs had given evidence of fractured limbs. Two of the injured animals were brought to the College and at once slaughtered, when on a careful examination being made the right humerus of one of them was found to be fractured in an oblique direction throughout a great portion of its length, and the surrounding tissues were much contused. The other animal also gave evidence of much contusion in the region of the shoulder-joint, and the surrounding tissues were likewise considerably infiltrated. From the evidence placed before us, together with the fact of the bone tissue being free from disease, we felt no hesitation in attributing the fractures to external violence applied directly or indirectly to the part, and suggested at the same time the probability of the donkey being the source of the mischief. This, however, seemed for the moment to be inconsistent, inasmuch as his removal was said to have been unattended with the immediate cessation of the evil, but the idea occurred to us that in the later cases fracture without displacement had firstly taken place, and that subsequent separation of the broken segments resulted, either during the ordinary movements of the animals, or in the act of rapidly descending the incline of the sea banks. Such an explanation received considerable support from the following letter of Inspector Hawtree's, which has since been received:

"Police Station,
"Rochford, Essex;
"*June* 14*th*, 1872.

"Sir,

"Referring to the case of breaking lambs' shoulders at Foulness Island, I have forwarded a bone from Southend which appears to me to have been broken in the same manner as the one you have already received.

"I find, on further inquiry, that the entire donkey had been seen to attack one of the lambs, and I believe that the whole of the injuries have been caused by that animal; and as to the injuries being in the shoulder, I am of opinion that if a lamb were to smell at a donkey's heels, it would be more likely to receive a kick in the shoulder than anywhere else.

"I have not heard of any similar case in the flock that

went to Rayleigh, neither have any more cases occurred at the Island.

"I am, Sir,
"Your obedient servant,
"Saml. Hawtree,
"Inspector.

"Professor Axe."

CHRONIC RHEUMATISM ASSOCIATED WITH EXTENSIVE CALCIFICATION OF TENDONS AND LIGAMENTS.

By R. B. Bemen, Veterinary Student.

The subject of this communication was a chestnut cart gelding, eight years old, the property of John Timms, Esq., Evenlode Grounds, Moreton-in-Marsh, to whom I am indebted for this opportunity of placing the case on record. About three years and a half ago the horse was purchased by Mr. Timms, and continued to work on the farm uninterruptedly until eighteen months since, when he was observed to move his fore limbs somewhat sorely, and to evince a desire to relieve the flexor tendons in progression by walking upon his toes. This continued for some time, during which a perceptible increasing enlargement of the tendons occurred, associated with still greater lameness, which, however, was subject to much variation.

After the lapse of a year, the near hind limb became involved in the diseased action, causing considerable lameness, and developing around the coronet a large bony tumour, as well as extensive fibrinous deposit about the fetlock-joint. Subsequently other parts of the body were similarly affected. The ribs became more or less enlarged, and the elbow and hock-joints frightfully distorted. In the trite words of the owner, "a disease was all over his body." It may be remarked that, during the progress of the affection, the animal continued to work without being subjected to treatment, excepting such simple measures as were adopted by the owner.

The historical detail is very incomplete; but feeling that considerable interest was attached to the case, and having casually observed it on several occasions during life, I requested Mr. Timms to afford me an opportunity of examining the fore

limbs after death, and for that purpose they were forwarded to me at the college.

On inspecting the parts below the knee, a superficial survey at once suggested the existence of considerable and important lesions. The limb was generally enlarged, the hoof of inordinate extent, measuring seven and a half inches from coronet to toe. The space between the heel and fetlock was rounded and prominent, and to the touch hard and unyielding. On removing the common integument this was found to be much thickened, while the subcutaneous tissue was highly condensed and converted into a white, dense, firm, fibroid mass of cartilaginous hardness, so inseparably blended with the surrounding tissues, that their respective limits failed to be recognised. The flexor pedis, perforatus, and perforans tendons, with their investing sheath, were much enlarged and indurated, as were also the annular and other ligaments of the fetlock-joint. After examination the parts were subjected to maceration, and on the removal of the soft tissues the perforans tendon was found to be completely calcified to the extent of eight inches from its point of insertion into the plantar surface of the os pedis. The surrounding subcutaneous tissue was similarly transformed, encasing the plantar vessels in a bony canal, and all being confounded with the altered tendon.

The navicular bone showed the line of an old fracture running transversely to its long axis, and occupying its outer third. Reunion of the broken pieces had, however, been effected at the expense of considerable bony deposit, which had sealed them to the underlying tendon. All the connecting ligaments of this bone were completely calcified, and its under surface roughened by ossific deposit. It may be observed that the above described lesions were symmetrical in the two limbs. Both navicular bones were fractured, the position and direction of the fractures being the same.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of May, 1872, have been

found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Foot-and-mouth	...	6	...	...	6	6
Bremen .	„	„	254	...	...	...	254	254
Coruña .	Plymouth .	„	6	...	...	...	6	6
„	Portsmth. .	„	2	...	...	...	2	2
Dantzic .	Hull . .	„	...	8	...	...	8	8
Dunkirk .	London .	„	...	5	...	...	5	5
Hamburg .	Grimsby .	„	...	9	...	...	9	9
„	Hartlepool	„	11	...	...	...	11	11
„	Hull . .	„	65	55	...	...	120	120
„	London .	„	65	77	...	...	142	142
„	Middlesborough	„	8	28	...	...	36	36
„	Newcastle-on-Tyne	„	...	75	...	...	75	75
Harlengen	Hull . .	Sheep-Scab .	...	2	...	...	2	2
Rotterdam	Harwich .	Foot-and-Mouth	...	2	...	...	2	2
Total . .		Foot-and-Mouth	411	265	...	...	676	676
„		Sheep-Scab .	...	2	...	...	2	2
Total . .			411	267	...	...	678	678

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 13th June, 1872."

CATTLE PLAGUE.

The last returns from France omit all mention of the Departement du Nord, beyond the mere statement that no case has been reported from that department from the 1st to the 10th of June. Possibly no fresh case may have occurred in that interval, but it may be taken as certain that the department is not free from the plague.

At the end of May ten communes were known to be infected, and it is not likely that, under the system which has been pursued, the disease could have been eradicated in a few weeks. The Belgian press remarks on this point that:—

"The cattle plague continues to prevail in the Departement du Nord, although with less intensity than during the past month."

Cattle plague has again recently appeared in three communes of the Arrondissement of Dunkirk, and also in the communes of the several Arrondissements of Douai, Cambrai, Valenciennes, and Lille.

In the French returns it is stated, in reference to the outbreak of the disease in Dunkirk, "the number of animals killed is not known."

Belgium has suffered from an alarm, whether true or false is not quite certain. On the 25th of May we learn that a beast presented, according to the report of the veterinary surgeon, the symptoms of cattle plague, and was forthwith slaughtered. Measures were immediately taken by the Governor of Brabant to isolate the infection and hinder the spread of the malady, precisely as if the case had been one of undoubted plague. A sensible proceeding, and, under the circumstances, much to be preferred to the more philosophic policy of waiting for results.

A fortnight later we are informed that no other case of the disease had appeared in the locality.

In Lower Austria the cattle plague still exists in several mote places, but no serious losses are recorded.

It is reported that the disease has quite disappeared from Taganrog.

SHEEP-POX.

This disease is reported to exist in three districts of the consular department of Stettin.

FOOT-AND-MOUTH DISEASE.

On the Continent foot-and-mouth disease is still extensively prevalent. The official returns show its presence in Pomerania, Hamburgh, Bremen, Dantzic, Belgium, France, and the Netherlands. In England the disease has assumed in several places a very virulent form. In Lincolnshire, and also in South Wales, a considerable mortality from the affection has occurred, chiefly among calves and pigs. In Norfolk also the disease is greatly on the increase.

From the *Chamber of Agriculture Journal* we learn that "the disease has made its appearance on the farms in the Aylesbury district, and is spreading with fearful rapidity, scarcely a parish escaping. Already upwards of thirty parishes have been reported, including Hartwell, Aston Abbotts, Stone, Dinton, Weston Turville, Cublington, Wing, Linslade, Whitchurch, Bierton, Aston Clinton, Weedon, Quarendon, Winchendon, Longwick, &c. On some farms the disease is of a very virulent type, and large numbers of the cattle have had to be destroyed. Sheep have also been affected. The disease has once more made its appearance in the neighbourhood of Bath. The disease is fast spreading, and in many places has appeared in its most virulent form. The agriculturists of the district are greatly concerned at the prospect of having to meet for the third consecutive season the expense, losses, and inconvenience which these visitations entail.

The foot-and-mouth complaint is still spreading fast in Dorset, above a thousand head of stock being affected. In Wimborne division alone 112 cattle, 470 sheep, and 37 swine are suffering on seventeen farms. During the past week there were fresh outbreaks at Sturminster, Marshall, Lytchet, Maltravers, Cow Grove, Holt, Hinton, Martell and Langham —Wimborne; Pinford Farm, Sherborne; Buckland Newton, Cerne; Duddle Dairy, Dorchester; and Melbury and Bourton, Shaftesbury. At Bridgewater during the past week fresh outbreaks have taken place on twenty-five farms, and the following stock are affected:—Bulls, 4; cows, 193; oxen, 9; heifers, 53; sheep, 254. This is a large increase on the last return. There is every prospect of the disease spreading through the whole district, unless the farmers take care to keep animals that have been affected isolated until the disease has quite disappeared. In Norfolk the offieial returns made up to Saturday week with reference to live-stock diseases exhibit an increase of a very serious character. Thus, the number of cases of foot-and-mouth disease recorded in the county for the week was no less than 10,312, as compared with 5102 in the week ending June 8th, 4117 in the week ending June 1st, 1603 in the week ending May 25th, and 1809 in the week ending May 18th. The attacks of pleuro-pneumonia recorded in the week ending June 15th were 12 in number, as compared with 12, 14, 3, and 9, in the four previous weeks respectively. In Essex, although the foot-and-mouth disease is still on the increase in the Dengie Hundred, as regards the number of animals affected, we are happy to learn that some of the more violent symp-

toms have disappeared, and that no further cases of death have occurred. In South Lincolnshire, 349 cattle, 1881 sheep, and 8 pigs were attacked with foot-and-mouth disease in the Spalding division during the week ending Saturday week, and 7 cattle, 2 sheep, and 1 pig, out of the above number, died of the disease. From Oxfordshire the official returns made by the chief constable of Oxfordshire to the clerk of the peace, up to Saturday last, are as follows:— Foot-and-mouth disease: Cattle, 312; sheep, 894; pigs, 43. Forty-seven cases of scab in sheep.

GLANDERS.

This malignant and fatal disease appears likely to assume proportions which it has not recently attained, if we are to judge from the number of cases which have been recently brought under our notice. In very few instances are the provisions of the law complied with, the owners appearing to think that it is quite unimportant as to how they deal with their glandered horses. Cab and omnibus establishments often suffer from the disease when other large depôts of horses are quite free from it. Such, however, does not seem to be now the case. The affection exists among cart and heavy horses, and also among those of the lighter breeds. In numerous instances it is associated with farcy, but many of the cases have no such complication.

Even in these days there is something to learn with regard to the pathology of glanders and farcy, which deep research and repeated experiments can alone determine.

A SECOND PLAGUE OF TICKS IN KENT.

Our readers will remember that, in the June number of the *Veterinarian* for 1869, we called attention to a plague of ticks (*Ixodes ricinus*), then existing in the neighbourhood of Wingham, Kent, and were enabled to give several instances in which these parasites had attacked lambs in such numbers as to destroy the life of the animal by the persistent irritation they produced.

Until now no further information has reached us with regard to a similar visitation, either there or elsewhere; but within the last few weeks many parts of the same county have again experienced losses among sheep and lambs from this cause. Nor have sheep alone suffered from an attack of ticks, as they have been found in abundance in the pas-

tures, on shrubs and trees, as well as on horses, cattle, and birds, and especially on young pheasants. There seems no reason to doubt that the two tick-plagues are connected with each other, and that during the interval which has elapsed the parasites have been enormously increasing in number, and greatly extending the area of their presence. At the time of the first visitation we placed several of the larger specimens, which had been received from Mr. C. Morgan, veterinary surgeon, Nonington, near Wingham, in a box, chiefly to determine the length of time the parasites would survive without food. On examining the box, on June 9th, 1869, the females were found to have expelled large quantities of ova, of a deep brown colour, and agglutinated together in masses, nearly equal in size to the ticks themselves. Some of the ova were collected into small glass tubes, and kept warm, day and night; others, similarly secured, were only subjected to artificial warmth during the day, and others, again, left without any application of heat in the box.

On June 25th the hatching process commenced in the lot kept constantly warm, and went regularly on up to July 2nd, when it was completed. In lot 2, subjected to warmth during the day only, the hatching process was delayed for more than a week; but when begun it went on without interruption, and was finished in about the same space of time as in lot 1. In lot 3--those left in the box—a still greater difference in the period of incubation was observed. Daily examinations, subsequently to the hatching of the two other lots, showed that the developing process was gradually going on; but it was not until July 26th—forty-seven days from the expulsion of the ova by the parent ticks—that any young ticks made their escape from the ova.

On June 28th some of the young ticks hatched on the 25th were placed in the upper part of the head of a pony, on the back of a cow, on the top of the shoulders of a lamb and a dog, on the heads of three sheep, and also on the head of a cat. None of these, however, could afterwards be found, notwithstanding a most diligent research was made for them. On June 30th others of the same hatch were placed on the inner part of the ears, and on the back of a *white* rabbit, for the subsequent better finding of them. Two days afterwards a few of those placed in the ears were observed to be very slightly attached to the skin, but the others had wandered away, and could not be found. On the same day some of the young ticks were put into the ears of two *white* mice, but these also could not afterwards be found.

Besides these experiments, in order to determine how long

they would survive without food of any kind, some of the young ticks were kept in the glass tube in which they had been hatched, wrapped in a little cotton-wool, and were found to be alive at the end of August.

A *précis* of these facts formed part of the annual report of the Governors of the College to the Royal Agricultural Society for the year 1839, and was published in the Society's Journal, Part 2, 1870. We have, however, thought right to give these details, as the subject has been taken up by the "East Kent Natural History Society," and as such they may assist in its further investigation. We should also add that through the kindness of Mr. J. Algernon Clarke, of the Central Chamber of Agriculture, we have at hand a good supply of parent ticks from Kent, and plenty of ova for additional experiments.

In the mean time every effort should be made by farmers and others to destroy as many as possible of the parasites, wherever they may be discovered, and nothing can be easier, in so far as those existing on sheep, in particular, are concerned. A simple dipping of the animals in diluted carbolic acid, as was pointed out in the report already alluded to, will be found to quickly destroy the parasites, notwithstanding their extraordinary tenacity of life.

Facts and Observations.

Singular Accumulation of Metallic and other Substances in the Stomach and Intestines of a Horse.—Mr. J. Begg, Manager of the Springbank Chemical Works, Bellfield, writes to the *Glasgow Herald* to say that the following materials were found in the stomach (?) of a horse, the carcase of which was sent to the Works on the 6th of March last:—"Broken nails, 629; nails 1½ to 2 inches long, 30; ditto, 1 to 1¼, 144; spring nails 1 inch, 131; ¾ inch tacks, 158; screw nails, 6 whole and 3 broken, 9; rivets, 2; broken gas burner, 1; shoe tackets, 15; broken pieces of metal, 129; nail heads, sorts, 102; small washers, 5; buttons, 4 whole and 4 broken, 8; pieces of lead, zinc, and round shot, 75; small pieces of wire, 121; pins, 33; ditto, broken, 4; needle, 1; ditto, broken, 20; small broken pieces of wire riddles, 889; glove catch, 1; boot eyelets, 7; hook and eye, 1; small wire staple, 1; small brass ring, 1; odd bits of metal, 8—in all, 2525 articles, weighing 3 lb. 2½ oz.; and of gravel and sand, 6 lb. 13 oz. Total, 9 lb. 15½ oz."

A New Source of Sulphur.—A new source of supply

of sulphur is announced in the *New York Times*. It is the island of Saba, one of the Dutch West Indies, situated about 110 miles south-east from St. Thomas, and 40 miles south-west from St. Martha. The island is of volcanic origin, about 11 miles in circumference, and at its highest point about 2800 feet above the sea-level. Though a Dutch possession, the language spoken by its 2000 inhabitants is chiefly English. The sulphur deposit was discovered by a person from New York, who, noticing indications of sulphur-ore, quarried, with the help of the natives, two sloop loads, which he took to New York, and submitted for analysis. The report of the chemists was to the effect, that while the Sicily ores yield only about 30 per cent. of brimstone for the ore consumed, the Saba ore yields an average of over 60 per cent. Adding to this the fact that the island is only about 1500 miles from New York, it will be seen that this is an important discovery, and it will not be wondered at that steps have been taken to secure leases of the best tracts on the island.—*Pharm. Journ.*

Peculiar Production of Ozone.—Professor H. Croft gives, in the *Chemical News*, February 24th, an account of an anomalous production of this compound which he has experienced. He states that, about six years ago, when evaporating some syrupy iodic acid, prepared according to Millon's process, over sulphuric acid, he noticed that when the acid began to crystallise, the air in the jar (covering the drying-dish) had a strong smell of ozone, or active oxygen. A couple of years afterwards, on again making iodic acid, this observation recurred to his mind, and he carefully tested the air in the jar during the evaporation ; no trace of ozone could be detected until the acid began to crystallise, when the smell of ozone became immediately perceptible, and all the usual tests for that body succeeded perfectly. During the last month he has had occasion to convert two ounces of iodine into iodic acid, and exactly the same result has been observed. —*The Popular Science Review.*

Tests for Detecting Strychnia.—Dr. Filhol has a paper on this subject in the *Journal de Pharmacie et de Chimie* for January, 1872. After having reviewed the various tests described in works of chemistry, the author concludes that as regards the sure detection of this alkaloid in cases of poisoning it should be obtained in a solid state ; the alkalinity of its solution should be ascertained as well as its intensely bitter taste ; its behaviour with chlorine, and its blue colouration under the influence of sulphuric acid and oxidising

substances, should also be seen; while, lastly, as a very delicate reaction, the author quotes that, when chloride of gold, strychnia (in solution) yields immediately a crystalline precipitate, which, although slowly, is yet formed in solutions containing 1-10th of a milligrm. of the alkaloid. This precipitate, and that formed by chlorine, are at once dissolved by concentrated sulphuric acid, and, chromic acid being added, the well-known blue colouration that strychnia yields with this last reagent is produced. The presence of alcohol in liquids to be tested for strychnia should be avoided.—*Ibid.*

Paralbumen in Serous Exudations.—In the *Chemical News,* March 1st, 1872, Dr. Hilger states that by paralbumen he means a modification of serum albumen, the alcoholic precipitate of which is soluble in water, and only partially coagulated by the addition of small quantities of acetic acid; this paralbumen has been hitherto only found in the hydropsical ovarian cysts, but the author has recently found it also in the fluid abnormally secreted in ascites.—*Ibid.*

Preparation of Pepsin.—This substance is now so much used in medicine that any improved mode of preparing it is of importance. Herr E. Scheffer thinks he has hit on some improvements in the following mode:—The mucous membrane of a previously well-cleaned hog's stomach is dissected off, chopped finely, and macerated in water acidulated with hydrochloric acid for several days, during which time the mass is frequently well stirred; the resulting fluid is strained, and, if not clear, set aside for twenty-four hours, in order to allow the mucus to settle. To the clarified liquid a thoroughly saturated solution of chloride of sodium is added, and the whole thoroughly mixed. The pepsin, separated from the rest of the solution by the addition of the saline solution, is found floating on the surface of the fluid, and is removed with a spoon, put upon cotton cloth to drain, and finally submitted to strong pressure, to free it as much as possible from the salt solution.—*Ibid.*

How Casein is formed in Lacteal Glands.—It is stated in a recent number of Pflüger's 'Archiv' that Dr. Daenhardt succeeded in extracting, from the lacteal glands of suckling guinea-pigs, a body which, by the addition of a mixture of the white of egg and carbonate of soda, was capable of forming casein. The doctor deduces from this that, as by a ferment of the saliva sugar is produced from starch, so by the ferment of the lacteal glands casein is produced from the albumen.—*Ibid.*

THE VETERINARIAN, JULY 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE VIENNA CONGRESS.

IN the last issue of the *Veterinarian* we gave a short account of the objects and scope of the Congress which has recently been held at Vienna for the purpose of discussing the scientific and commercial aspects of the subject of cattle plague.

The summary of the questions proposed for discussion, as stated in the last number of the Journal, is as follows:

1. Is Russia in a position to take efficacious measures for preventing diseased or inspected cattle crossing its frontier into other countries?

2. What are these measures, and what are the conditions to which the passage of these cattle to the frontier must be subordinated?

3. If Russia cannot furnish every desirable guarantee, would it be necessary to interdict entirely the importation of Russian cattle, or will it suffice to submit this importation to certain conditions?

4. If the importation of raw animal products derived from Russia is permissible, what are the conditions to which it should be subjected?

5. What are the precautionary measures which ought to be observed during the passage of cattle and raw animal produce imported from Russia? How must the means of transport be disinfected?

6. What are the general principles on which proceedings should be taken whenever it is necessary to abolish the ravages of cattle plague beyond Russia?

7. To what restrictions ought the traffic in cattle and raw animal produce coming from the Roumanian Principalities, Servia, and Turkey be submitted?

We remarked that other countries seemed to have expected

that the subjects discussed would be chiefly professional, and, therefore, provided efficient veterinary representatives, and we suggested the question which we owe it to the profession to answer as best we may. Ought not we to have done the same?

There was nothing of the precipitant, be it understood, in the arrangements which were made for the representation of Great Britain at the Conference. More than a year ago the subject was under consideration, and we may venture to state, taking upon ourselves whatever amount of responsibility may attach to the statement, that the selection of a professional representative was in accordance with our deliberately expressed opinions.

Our experience at the previous Conferences in Vienna and Zurich has established in our mind the conviction that no more can be done than has been done in the direction of scientific talk; of work there is enough and to spare in arrears, but it is not in conference that this will be cleared off.

We know more of the laws which govern the spread of cattle plague, the nature, symptoms, and progress of the malady, than we know of most other affections; certainly no malady of the lower animals has been so minutely investigated, and the question which really presses for solution is, how can the disease be excluded from importing countries without vexatious and restrictive interference with the supply of animals? In fine, how to keep out cattle plague by the establishment of universally applicable rules, which shall not interfere with the cattle trade. This, it was understood, was to be the salient point in this discussion, and on this understanding it was concluded that a gentleman who was perfectly familiar with the working of the act and rules relating to infectious and contagious diseases of animals would be a more efficient representative than a professional man, who would naturally be inclined to give prominence to the scientific aspect of the question, an aspect which had already sufficiently contemplated without practical results.

The Secretary of the Veterinary Department, Mr. Alexan-

der Williams, was accordingly selected; and if we may judge from the comments of the Austrian press, he fulfilled his mission in a satisfactory manner.

In the leading article of *Die Presse*, of Tuesday, April 9th, we read, "In the declaration of universal principles of international commerce lay the simple, sole problem of the international conference, whose delegates assembled here from almost all the European countries. Russia and Turkey were especially remarkable for the readiness which they evinced to aid and forward the resolutions which were adopted by the Conference."

"It must not, however, be forgotten that self-interest must form a powerful element in the said readiness. England, which in most international questions can, thanks to special circumstances, adopt an attitude of reserve, was represented by Mr. Williams, who was careful, before everything, to give prominence to the politico-commercial relations of the question, and many of the propositions brought in by the English representative, and accepted by the conference, were eloquent of the practical sense with which England is accustomed to deal with such subjects."

Altogether sixty-six questions were submitted to the Conference in the interrogatory, but the major part of them was easily disposed of.

The decisions which were accepted unanimously, or, as the English representative expressly remarked, without objection, may be concisely stated as follows:

Every country is required to arrange such a system of sanitary police as may be necessary to ensure the speedy extinction of cattle plague, in the event of its appearance.

Every state will charge itself with the payment of indemnities to the owners of animals slaughtered on account of cattle plague.

Every state is expected to adopt some uniform method of disinfecting the machinery for the transport of animals diseased or suspected, and the products thereof.

In regard to international commerce, the Conference proposed to permit the greatest extent of freedom consistent

with safety, even in countries in which the cattle plague had broken out; providing that in such countries all possible measures of precaution have been adopted consonant with those in force in neighbouring states. Prohibition of exports is to extend to the infected districts only, and not to the entire country in which the disease has appeared.

Immediately on an outbreak of plague being detected, all the diseased animals are to be killed; all those which have been herded with them are to be isolated, and placed under observation.

The appearance of cattle plague in a herd, during transport, is to determine the slaughter of the herd.

Every state is to publish a weekly bulletin referring to the progress of cattle plague, and directly on the discovery of the presence of the disease a state is expected to telegraph the information of the fact to the neighbouring states, and no state shall permit the transport to other countries of animals which it would not permit to remain alive in its own jurisdiction.

Finally, we may state that the decisions of the Conference are not authoritative, it having been from the first clearly understood that the representatives of the various powers were free to express their own views without in any way pledging their respective Governments to take action thereon.

Extracts from British and Foreign Journals.

THE PRICE OF SHEEP IN AUSTRALIA.

The *Melbourne Leader* says:—Long lustre-woolled sheep are beginning to be highly appreciated in this colony. The sale by Messrs. Powers, Rutherford & Co. of the late Mr. T. Austin's flock of pure and cross-bred Lincolns, which took place at Barwon Park, furnishes ample proof of this. The number of this breed of long-wools disposed of under the hammer of the auctioneer was the greatest and the prices were the highest ever obtained in the colony. Pure Lincoln rams fetched from £21 to £112 each; do., weaners, £10 to

£58; pure Lincoln ewes, two-tooth, £31 to £51; do., four-tooth, £56. Imported full mouth ewes were sold from £8 to £31 each. Pure Lincoln ewes, weaners, fetched £9 to £25 each. Ewes (weaners), three quarters bred to nearly pure, 1451 in the lot, brought £1 13s. each; 925 three quarters bred two-tooth ewes, £1 14s. each; and 838 four-tooth three quarters bred ewes, in lamb to pure Lincoln rams, £1 10s. each; while 1497 cross-bred ewes brought 15s. 6d.; and 800 fat wedders 12s. each. With such prices obtainable it should no longer be matter of doubt with farmers as to whether keeping long-woolled sheep will pay or not. This sale at Barwon Park will have the effect of causing those farmers who are resident in suitable districts to put their fences in order, and make a commencement with sheep in conjunction with their cultivation. The improvement of the breeds of long-woolled sheep in England gave rise to the present improved system of agriculture in Britain. Many poor soils which previously would not pay for cultivation were rendered fertile and profitable by means of sheep. The poor, bleak Cotswold Hills in Gloucestershire, the chalk wolds of Lincolnshire, and the light soils of Norfolk may be mentioned as illustrating the value of these useful animals in rendering fertile naturally poor and unpromising soils. The demand for long lustre wools and tinned mutton in Britain combine to render sheep profitable stock for the farmer to keep in many parts of this colony. By means of these invaluable animals much of the worn-out land will in the course of time be again rendered profitable to cultivate. Indeed, the grain-growing farmer, if he be desirous of avoiding the rocks and shoals of barrenness, can invoke no more powerful aid in making the production of cereals as profitable as it is capable of being made, than that of "the animal with the golden hoof." We look forward to the introduction of sheep to the farms of this colony as the advent of a new era in the progress of agriculture, and restoration of the wealth and prosperity which have begun to wane under the exhaustive practice of constant grain-growing.

A subsequent issue of the same journal says:—Pure and cross bred Lincoln sheep are at present in high favour with farmers and flock-owners in the Western district, as witness the astonishingly long prices paid for these animals at the sale of the late Mr. Thomas Austin. Other long-woolled breeds, such as the Leicesters and Cotswolds, have also their admirers. Under present circumstances, with the high prices realised for long lustre wools, our flock-owners are, no doubt, extremely desirous of procuring as much as possible of this

most marketable commodity. Yet some of our breeders foresee—and this result may safely be prognosticated—that owing to climatic causes the heavy fleeces of the English breeds will gradually become lighter. Indeed, the colonial bred animals from imported stock sold at Barwon Park afforded marked evidence of deterioration, both as regards weight of fleece and size of carcase, and in these two points contrasted strongly with the better developed and closer if not quite so long-woolled cross-breds. On the other hand, it must be remembered that Victoria is the home of the merino, and the finest wool in the world is produced under the influence of our sunny and genial clime. Unfortunately the wandering propensity engendered in this breed through long years of shepherding, too often on but scant pasturage, to say nothing of its small frame, has unfitted the merino to meet the requirements of the cultivating farmer whose fields are small, and who would at times require to confine his flock within the narrow limits of a fold formed of twine nets or light wooden hurdles. The requirement of the times on arable farms in Victoria is a quiet, docile breed of sheep, combining all the best qualities of say the Lincoln, with those of Australian merino; animals possessed of sound, vigorous, strong constitutions—and this is a point of primary importance—yielding off large frames fleeces as heavy and wool as fine, long, and lustrous quality as is compatible with the climatic conditions of the country. They should possess the early maturing tendency and aptitude for converting a given amount of vegetable produce into the largest money profit which is one of the chief characteristics of the improved English breeds. Climate will regulate the length, lustre, density, and fineness of the fleece. Development of frame is entirely dependent on the quantity and quality of the food that may be supplied. As regards the capabilities of our climate to produce an abundant supply of food for sheep, it is in every respect infinitely superior to the climate of Great Britain. All that is wanted to develope the latent resources of the soil and climate in the production of animal food by human skill and industry is a breed of animals such as we have here delineated to convert the food produced into a source of profit to the cultivator. Does any incredulous reader, if one there be, smile at the idea of developing and fixing a breed of sheep, one in every way thoroughly adapted to the pressing requirements of the Victorian farmer? Let such an one bethink him how the present so-called "pure bred" Shorthorn cattle have been produced; how the breeds of sheep are at the present time being improved and adapted

to local requirements in Riverina; how even Bakewell, that prince of breeders, established his Dishley flock of "pure Leicesters," for it has been surmised that this was the product of cross breeding. The Messrs. Learmouth, Currie, Shaw, and Graham have shown what can be done in the way of producing and maintaining the renowned Australian merino. Who will be the first to give our farmers, as Bakewell did the farmers of Britain, a breed of Australian long-woolled sheep? The path is clearly defined. All that is wanted is some one possessed of the skill, patience, and perseverance of a true breeder to work out the result.

THE INFLUENCE OF FOOD IN THE PRODUCTION OF MILK.

It is a well-established fact that the milk of the cows of town dairies is inferior in composition to that of the cows on ordinary farms. Dr. Cameron states that out of forty samples of pure milk obtained from Dublin dairy cows, not one contained less than 11½ per cent. of solid matters; whilst most of them included more than 12½ per cent. of dry substances. There is a popular notion that town milk is very inferior to country milk. No doubt, when city dairy cows are fed on unwholesome slops, and confined in insufficiently ventilated stables, the milk which they yield is poor, and probably wanting in the essentials of a healthy food. Such is the character ascribed to the notorious "swill milk" with which so large a proportion of the citizens of New York are supplied. In British towns, however, there is no doubt but that the milk of the dairy stock is very rich naturally, and is only rendered poor by the fraudulent addition of water. It is not the interest of the dairymen to feed their animals poorly. They know very well that it is only by means of abundant food that they can maintain efficiently and prolong the lactescent qualities of their cows. Why is it that "country cows" are not equal as milk producers to the "city kine?" Simply because the former are not nearly so well supplied with food of a nourishing character. Although the milk of country cows often contains 13 per cent. of solid matters, yet occasionally its percentage of really useful ingredients sinks to nearly 10, and on the average is not more than 11½ per cent. The yield, too, is in favour of town cows as against farmers' cows. We believe, then, that it would be to the advantage of farmers if they would feed their dairy stock a little more liberally. Of course, we do not mean to assert that all farmers stint their

dairy stock; but we believe that many of them forget that cows which are yielding milk require a very large amount of nourishment—and more than they usually receive—during winter. It is generally believed that the nature of the food supplied to milch cows greatly influences the composition of the milk. Some contend that certain pastures produce milk rich in butter, whilst others maintain that the cheesy element in milk is increased by the use of particular kinds of feeding stuffs. There has, however, hitherto been a want of exact knowledge relative to these points, experiments made for the purpose of elucidating them having given apparently discordant results. Drs. G. Kuhn, A. Haase, and H. Baesecke, distinguished German experimentalists, have recently made some very accurately conducted experiments, with the view of clearing up this question. A number of cows were experimented with. The amount and composition of the food given daily to each animal was ascertained, and the quantity and quality of the milk yielded by each determined. The results arrived at were chiefly as follows: An increase in the albuminous and fatty elements of the food produces an increase in the yield of milk, the proportion augmenting until a certain maximum is obtained. At the same time the condition of the cow improves, until a maximum weight is also reached, corresponding with the maximum yield of the milk. Sooner or later, however, there comes a decline in the natural secretion of the milk, which no amount or quality of nutriment can arrest. Diminution in the nitrogenous and fatty ingredients of the food cause, on the other hand, a decrease in the quantity and a deterioration in the quality of the milk. It is rather remarkable that according to the results of these experiments, an increase in the fatty elements of the food exercises no influence on the amount of butter in the milk. It is useless, then, to try to produce a rich butter giving milk by feeding cows on oily food such as linseed, &c. With respect to the casein or cheesy (nitrogenous) portion of milk, it is also uninfluenced by the relative proportion of nitrogenous matter contained in the cow's food. In one case there was actually a decrease in the cheese following an increase in the nitrogenous portion of the food. The general results of these experiments seem to show that it is in vain to produce "a cheese-giving" or a "milk-giving cow" by supplying the animal with food containing an excess of albuminous or of fatty matters. It is to the breed of the animal that we must look when selecting milch stock. It is, however, well to know that just in proportion as cows are supplied with ordinary food, so will their yield of milk be

more or less abundant. We cannot hope to get milk rich in butter by withholding nitrogen from the food, nor, on the other hand, can we expect to obtain a cheesy milk by stinting the fatty elements of the food. These and similar investigations are proofs of the necessity of studying more carefully the physiology of the animals of the farm.—*The Irish Farmers' Gazette.*

CATTLE POISONING IN INDIA.

A HUGE report on cattle plagues in India has just issued, according to the *Friend of India*, from the Government press. Its thousand pages represent the labours of a Commission appointed in 1869, under the presidency of Staff Veterinary Surgeon Hallen. Its contents include an interesting abstract of evidence bearing on the crime of cattle poisoning, which has of late years been disagreeably rife in various parts of India, more especially, perhaps, in the districts of Jaunpore, Benares, Ghazipore, Azimgurh, Mirzapore, and Allahabad, all lying together in the south-eastern corner of the north-west provinces. We remember that some twenty-five years ago Cawnpore bore an evil name for rascality of the same sort, and that officers' horses passing through the station in charge of native grooms sometimes fell a prey to the greed of unscrupulous *chamars*, or leather-dressers, who turned the hides to good account. In the present report, however, it is bullocks, kine, and buffaloes that suffer most from the same cause. According to Dr. Chevers, in sentencing a man tried at Sholopore in 1864 for cattle poisoning with balls of a white substance sewn up in *karbee* leaves, the judge spoke of the crime as far from uncommon. In 1851 four *chamars* were convincted at Sarun of poisoning cattle with aconite for the sake of their hides. In this case the poison was applied by pricking the beasts' heads. Poison balls of aconite, arsenic, datura, or some other drug are mixed up with the food the cattle eat, or introduced into their bowels in other ways. Sometimes the *chamar* employs a woman or child to drop poison in the field where cattle are grazing. An immense quantity of arsenic is imported yearly into every Indian port, and for controlling the sale of this poison no act has yet been enforced, except one passed for the Bombay Presidency in 1866. The detection of the crime is made the more difficult by the inability of the police to take any

measures concerning it without an express order from the magistrate. The impunity of the village *chamars*, who are the chief culprits, is largely increased by their usefulness to the village communities in respect of various functions which they alone can discharge. For the purpose of checking so mischievous a crime it has been suggested that the offence should be directly brought under the penal code, that the sale of poisons should be carefully restricted and registered, that the burial of carcasses and the destruction of hides should be rigidly enforced, that the sale of hides should always be registered, and heavy penalties exacted for every breach of these rules.—*Allen's Indian Mail.*

MEMORIAL TO HARVEY.

One of England's greatest scientific celebrities is about to be raised from the ungrateful forgetfulness to which he has been hitherto consigned. Harvey, who, by the discovery of the circulation of the blood, raised physiology from mere guesswork to comparative certainty, is at length to be honoured by the erection of a national memorial. The townsmen of his native place, Folkestone, have resolved not to allow the tercentenary of his birth to pass unnoticed, and it has been decided that a bronze statue, if possible of a very superior class, shall be erected to his memory. A committee is in process of formation in London to assist the Folkestone committee, and public scientific bodies and individuals are being asked for aid and co-operation. The Archbishop of Canterbury, Lord Granville, the Presidents of the Royal Colleges of Physicians and Surgeons, Sir Thomas Watson, Sir Henry Holland, Sir William Fergusson, Sir William Gull, Sir James Paget, Baron M. de Rothschild, M.P., Lord Robert Montagu, M.P., Dr. Owen Rees, Dr. Quain, Dr. Bence Jones, Mr. F. C. Skey, C.B., Mr. John Simon, Mr. Ernest Hart, and others, have already promised support; and the sum of £300 has been at once subscribed. As soon as sufficient funds are promised to assure the committee of success, His Royal Highness the Prince of Wales will be asked to preside at a public meeting, to be convened at the hall of the Royal College of Physicians of London, which has been kindly offered for the purpose by the President and Fellows. We gather from the report of a public meeting held at Folkestone, at which the Mayor presided, that Mr.

Simon, the medical officer of the Privy Council, warmly advocated the movement, and, in the course of an eloquent speech, made the following observations:—"Harvey, in teaching the fact of the circulation of the blood, in teaching what duty is done by each beat of the heart, in relation, on the one hand, to the functions of respiration, and, on the other hand, to the nourishment of all textures of the body, gave us our first groundwork of animal physiology. It is no exaggeration to say that, in giving to the world that first precise knowledge of the circulation of the blood, he laid the indispensable foundations for all physiology that has followed or can follow; and surely this achievement by our countryman is something for us all to honour and be proud of." The treasurer of the fund is Dr. Bence Jones, F.R.S. Donations may be made payable to the "Harvey Tercentenary Memorial Fund" at the Western Branch of the Bank of England, Burlington Gardens, London; or may be sent to the treasurer; or to the honorary secretaries, Mr. G. Eastes, M.B., 5, Albion Place, Hyde Park Square, London, W., and Mr. W. G. S. Harrison, B.A., Town Clerk, Folkestone. Mr. Eastes is now engaged in organising a strong London Committee.—*British Medical Journal.*

SUPPLIES OF OPIUM AND SCAMMONY FROM TURKEY.

By P. L. Simmonds.

It may prove interesting to the trade generally to have some reliable figures as to the two important drugs which we draw from the Ottoman Empire. In Turkish opium there has not been any important fluctuation of late, but the extraordinary increase in the imports of scammony in the last year of which we have the official details is remarkable, being about treble the ordinary supply. It probably arises from the scientific exertions of the Turkish authorities, and the practical information and instruction which have been diffused among the peasantry.

Opium.—From an examination of the official annual statements of the trade of the United Kingdom for some years past, we are able to trace out accurately our imports of opium from Turkey, and the value; these have been as follows:

	lbs.	Value.
1866	214,399	£180,001
1867	294,277	248,015
1868	363,249	464,191
1869	230,886	382,471
1870	313,543	452,974

Although the official Board of Trade return, enumerating the principal articles received last year, has been published, the more precise annual statement, which specifies also the minor articles, will not be issued for some months to come.

An interesting monograph on the varieties of opium exhibited in the Turkish department of the last Paris Exhibition, was privately issued by Colonel Fayk Bey, director of the central civil and military pharmacy, chemist to the palace, and professor of pharmacology to the imperial faculty of medicine at Constantinople. This document contained much valuable information, being the result of answers to official circulars addressed to the governors of provinces, as to the mode of culture, collection of the juice, manipulation and transformation into cakes, and nature of the commercial transactions as to the seats of production. Moreover, a complete analysis was furnished of ninety-two specimens, which were shown.

On the culture and propagation of the plant I need not enter into details, but a few particulars respecting the collection of the inspissated juice may be given. Great care and vigilance are required to seize the proper time, when the bluish-green colour of the capsule begins to change to a golden hue, to incise it horizontally. Leaves of the poppy are first spread on the soil, to receive any of the milky juice which may accidentally drop. In localities subject to frequent showers, the incisions are made in the capsule about daybreak, and the milky juice, which oozes forth, is collected before noon. In the drier regions, where a more equable temperature prevails, the capsules are incised before sunset, because night favours the secretion of the sap, which is then collected on the following morning. After collecting the juice the capsules are left to ripen, the seed being saved for sowing, or for obtaining oil, and the oil-cake, after expression, is used either for manure or for feeding cattle. A certain quantity of the capsules, either broken and freed from the seeds or entire, are sold for pharmaceutical use. In certain localities the poppy seeds are eaten for pleasure, and sometimes, among those who give way to this practice, a slight narcotic effect is observed.

A deunum of good land (about 1600 square yards), well prepared, will yield from 2 to 2½ okes of opium and 5 bushels of seed. But the yield of both opium and seed varies considerably.

The inspissated juice is collected in earthen, copper, or wooden vessels, and a few days later it is moulded or kneaded into shape by the hands, with heat. After exposure for some time to the sun, the lumps or cakes are rolled over Rumex seeds, and wrapped in poppy leaves, in which state they pass into commerce. The great variety of shape, size, and appearance of these cakes of opium is remarkable, for each locality seems to have a special type or form of its own.

The cultivator is always under heavy liabilities to speculators and dealers, who purchase his crop in advance, and 18 to 25 per cent. interest is considered moderate. From these factors it passes again through three or four hands before it arrives at the ports of shipment.

The opium obtained from small poppy-heads is the most rich in morphia, and siliceous clayey soils are found to be more favorable to the production of opium than light friable soils.

The following was the export of opium from certain localities in Turkey in the year 1866, which will serve as an indication to the principal seats of production:

Localities.	Okes.
Ighakli	6,250
Tchol	3,125
Kikler	1,250
Bolvadina	3,125
Hanya	3,125
Sandikli	1,875
Chahvar	6,250
Cheiklou	12,500
Kara Hissar	18,750
Sihanli	7,500
Gueive	2,000
Lefke	200
Gueul Bazar	800
Kara Hissar Sahib	81,250
Kharpout (Malatia)	50
Rhodes	2
Baloukesser	2,000
Angora (Mihalidjik)	2,000
	152,052

As the oke is reckoned at 2¾ lbs., this gives about 418,513

lbs. of opium, the approximative local value of which was 40,000,000 of piastres.

If the growers were free from the rapacity of the usurer, no more profitable culture could be carried on than opium. Taking the ordinary yield of a deunum of land at 2 okes (5½ lbs.) of opium, at the mean price of 230 piastres, and adding 5 bushels of seed worth at least 30 piastres the bushel, this gives a total value of 610 piastres. If from this 200 piastres be deducted for the maximum expense of cultivation, this leaves a profit of 410 piastres (about £4), a higher return than can be obtained from any other culture.

If it were not stated by an officer of the government, we should hardly have credited the extent of adulteration carried on, and which has to be guarded against by the purchaser.

Amongst the adulterating substances enumerated are scrapings and decoctions of the stem and leaves of the poppy, raisins, glucose, the pulp of fruit, the yolk of eggs, wax, marble, powdered bricks, rosin and galipot; all these are called into requisition to render the opium more heavy and to add to its bulk. Often 10 to 12 per cent. of water is added. Of late years one or two large shipping firms have retained chemists to analyse and certify to the quality of the opium they export, which is sold with a guarantee; but the small dealers and local druggists are still subject to all these current frauds.—*The Pharmaceutical Journal and Transactions.*

COTTON SEEDS.

By Horation N. Fraser.

From the time when cotton was first cultivated in the United States until within a few years, the lint or fibre was the only part used either in medicine or the arts; the seed, or all that part not used for re-planting, was considered as having no value, and was looked on only as an incumbrance. Since these seeds weighed nearly twice as much as the part formerly used, it became the subject of thinking men's experiments—how they could be turned to some use; and the results of these experiments have led to the discovery and subsequent usage of the various products obtained therefrom.

A chemical analysis of the seeds demonstrated that a large percentage of a fixed oil could be produced from them, and not only that, but that the kernel might be advantageously used for food for animals. This latter was tried some years ago, but led to bad results ; for even the best gins which were invented could not separate the lints entirely from the seeds to which it adhered, consequently this insoluble matter, with the hulls, formed hard masses in the stomach, and produced even fatal effects from the irritation of the membranes of the intestines. But, to obviate this, hullers have been made which decorticate, or remove the hull, with the adhering lint, entirely from the kernel. This is almost an invaluable invention for the planter ; for, when we consider the millions of pounds of cotton which are annually produced in the Southern States, and also that the weight of seed is double the weight of the other portion, then we may be able to estimate the value of these seeds when turned into nutritious food for stock.

Since small hullers have been introduced on many of the plantations, the planters are enabled to hull their own seeds. These are thrown into the top of the hullers, and first come in contact with knives, which cut the hull; then they are passed through sieves, by which process the kernel and hulls are separated. The kernel is divided into two portions; the first is that part which has been broken or cut by the knives; this is ground to make the meal used for feeding, and constitutes one third of the whole weight of kernel. The remaining two thirds come out whole, and are sold for other purposes. This meal has been found to be as rich in flesh and fat producers as linseed meal for stock, and supersedes the use of it in the cotton-growing States. The hulls are piled in heaps until they arrive at the right state of decomposition to be used as a fertiliser, for which they are well adapted, being rich in the phosphates and lime characteristic of substances used for this purpose. The seeds contain a fixed oil to the amount of about thirty-seven per cent. of the weight of the kernel, most of which is obtained by expression.

At the factory on Long Island, which the writer visited, the seeds are bought with the hulls on, although the whole kernel is generally bought directly from the planter. These are first thrown into a gin, which separates some more of the lint. This is packed in bundles and sold for ordinary cotton batting. From this they are conveyed to the hullers and undergo the decorticating process. The kernel is then carried by an elevator to a box, which feeds two large iron

rollers, converting it into meal; the meal is put into a large vessel heated by steam, to render the oil more fluid, and then is put between iron plates, which are forced together by hydraulic pressure, which presses out nearly all the oil and some mucilage. About eight per cent. of oil is left, which cannot be removed except by solvents. This oil, as then obtained, is of a handsome dark wine colour and sweet taste. This then undergoes the purifying and bleaching process, which is kept a secret by the manufacturers.

The purified oil is either a golden yellow or white colour. An oil is also produced by chilling the purified oil, and expressing, to obtain a variety almost free from stearine, called by the manufacturers "winter oil," from the fact that cold will not thicken it.

This oil is used extensively in the arts, chiefly to adulterate and substitute higher-priced oils. Cheap paints are ground in it, and it is used to a certain extent to adulterate linseed oil; but being a non-drying oil, only a small percentage could be used.

It is also used for adulterating sperm oil for burning, and for mixing with lard oil. The most practical way to detect these is to heat the suspected oil with distilled water; separate the water and add a solution of subacetate of lead. If it contained cotton-seed oil, a white precipitate will be formed, on account of the presence of mucilage, which is always found in this oil. If the sperm or lard oil is pure, it would be indicated by the absence of any milkiness.

It is also used to adulterate olive oil, and chemistry has found no practical mode by which they can be definitely distinguished apart.

A soap has been made of the residue left after refining. It is of a more or less dark brown colour, and disagreeable smell. It is used in the laundry, and sells from three to seven cents a pound, according to quality. It was also attempted to make a soap from the white oil. This, when first manufactured, is of a handsome white colour, but after standing some length of time it becomes dark, and finally almost black. It is not made now.

It is used to the amount of ten per cent. in making fancy soaps, to give them a good lather, for which the oil is said to be the best known; but even in this small amount the odour of the rancid oil can be detected.

The hulls are used for fuel in the factory, and the greater part of the cake-meal was sent to Europe, the farmers of this country, at that time, not being generally acquainted with its properties. It sold for about thirty dollars a ton.

A few years ago the oil was noticed in the journals in connection with preparations of pharmacy, to be substituted for oils in liniments and ointments, for which it is adapted by its properties as an emollient, but nothing definite was arrived at. Being cheaper than even the commonest grades of olive oil, and resembling it so much in its behaviour, it is peculiarly fitted for the preparations of the pharmacopœia in which the oil is used. Mixed with aqua ammoniæ in the officinal quantities for "Liniment. Ammoniæ," it makes a product which has all the essential properties that are indicated by the olive oil, and has the advantage of not forming so thick a mixture, thereby making it more convenient. In the "Lin. Camphoræ," it seems to serve exactly the same purpose as the officinal oil.

Lead plaster made with the cotton-seed oil has been substituted with advantage for the officinal, and has been used to mix with it the amount of fifty per cent. by some manufacturers of the plaster. This, made with the cotton-seed oil alone, forms a handsome, light-coloured plaster, apparently equal in all respects to the English, with the exception that it does not become hard enough to keep its shape, in the usual form of selling it. But when mixed with olive oil in equal proportions, this difficulty is entirely overcome.

The cost of the plaster made with the cotton-seed oil, using the best English litharge, is twenty cents per pound. This difference in the cost, combined with the practicability of using it, will recommend it to the more careful examination of druggists who deal extensively in this preparation.—*Amer. Journ. Pharm.*

ACTION OF WATER ON ZINC; EFFECTS OF DRINKING WATER CONTAMINATED WITH ZINC.

The experiments of Boutigny, Schaueffele, and Langonné have long since shown us that zinc dissolves in potable waters at ordinary temperatures; that distilled water and rain water dissolve zinc more readily than hard waters, especially those that are rich in chalk. They have shown, however, that hard potable waters do not take up zinc to an appreciable extent, for the zinc speedily becomes coated with an insoluble layer of zinc hydrate (hydrated oxide), or, more commonly, of hydro-carbonate (hydrated oxide and carbonate); but still a portion of the metal remains suspended, whilst a smaller portion, perhaps, passes into a state of true solution. Thus, all kinds of vessels in domestic use, whether made of zinc or "galvanized," impart to waters kept in, or allowed to pass through them, a certain quantity of zinc. The quantity of zinc thus taken up may even be sufficient to render the water opalescent, and unfit for drinking purposes.

Fonssagrives,* taking up the question of the nocuity or innocuity of waters kept in zinc vessels, or in those which are galvanized (*i. e.* coated with zinc), investigated it by the data furnished by records of the public health, by the experience of naval hygiene, and by experiments on man and upon animals. He does not, however, adduce any experiments of his own. A French Government Commission had previously, on what appeared to Fonssagrives insufficient grounds, decided that water kept in vessels of zinc is injurious to health. Boutigny had likewise attributed very grave effects to the use of waters thus stored, and even imagined that epilepsy might be produced by the ingestion of zinc oxide. Fonssagrives concluded, as the result of his investigations, that the insoluble preparations of zinc produce no digestive disturbances except when taken in large doses, and that they do not accumulate in the economy. He admits that water in contact with metallic zinc becomes coated with zinc compounds, but that these—zinc hydrate, hydrocarbonate, and ulmate—are almost insoluble. Rain water passing over the metal may, nevertheless, remove some zinc in solution, as zincate of ammonia. These compounds, he states, exist in waters in such small quantities that no injurious effects can, in his opinion, result from their use. He

* 'Ann. d'Hyg.,' t. xxi, p. 64.

adds that the facts drawn from toxicology, naval hygiene, public hygiene, and therapeutics, all attest the innocuity of water that has rested upon zinc. In consequence, the use of zinc and galvanized iron cisterns, of zinc pipes, and of galvanized iron pipes, for the conveyance of water, cannot be considered dangerous to health.

Others, nevertheless, hold a different opinion. Pappenheim* states that, though the amount of zinc present in such waters as have been spoken of is not always sufficient to produce poisonous effects, since it is indubitable that they have frequently been employed for considerable lengths of time with impunity, yet the amount of metal taken up by large quantities of water may be sufficient to produce deleterious results. He states, moreover, that in France, spite of Fonssagrives' assertions, the water tanks of ships have had to be regalvanized and tinned, and that zinc vessels have to be especially avoided. Dr. Parkes likewise states † that Dr. Osborne, of Bitterne, has frequently observed injurious effects from the use of waters impregnated with zinc.

Of the fact that water does, under certain conditions, act energetically upon zinc and upon galvanized iron, I have had abundant evidence. Some months ago I was consulted by a gentleman relative to the water-supply to his house. The existing supply, from a well on the premises, furnished an excessively hard, chalky, and seleniferous water. It being desirable, for many reasons, to have a soft water, I advised that the rain water from the extensive slate-covered premises should be filtered and stored for use, as the house was remote from possible sources of contamination of the rain water. As a matter of precaution, I recommended the use of iron pipes for conveying the water, and that, after filtration through charcoal, sand, and gravel, the water should be stored in a tank lined with asphalt. Against my knowledge, galvanized iron pipes were used instead of those of iron only. The consequence of this has been that the water passing from the reservoir through the galvanized pipes has for many weeks been turbid and milky in appearance. It contains a notable quantity of zinc in suspension, and some in solution. I may remark that zinc in solution in potable waters is best detected by the addition of potassic ferrocyanide to the clear water after acidulation with hydrochloric acid, when a whitish cloud will immediately form if zinc be present. Of course this reaction must be confirmed by other and well-known tests. I know of no test for zinc which is so delicate as this.

* 'Handb. d. Sanitätspolizei,' B. ii, p. 765.

† 'Manual of Hygiene,' 3rd edit., p. 12.

What might be the effect of drinking such water as I have described I cannot say, for no one would touch it if other water were to be obtained. Probably its continued use might be productive of injurious effects.

Engineers should bear in mind this effect of *rain water* upon zinc and upon the so-called galvanized iron.—*Guy's Reports*, vol. xvii.

THE COUNTY OF MIDDLESEX AND THE CONTAGIOUS DISEASES (ANIMALS) ACT.

The local authorities of Middlesex have always shown exemplary vigilance in carrying into effect the various provisions of the Act and order relating to contagious and infectious diseases of animals. In the time of the cattle plague the energetic action which was taken had most satisfactory results; and, now that cattle plague no longer exists, the same authorities continue to apply all the restrictive means at their command for the suppression of the less serious but sufficiently annoying maladies, pleuro-pneumonia, foot-and-mouth disease, and sheep scab, and, not least, glanders among horses. The report of the Executive Committee to the Court of Quarter Sessions is now before us, and we do not hesitate to say that the scheme which the committee have hitherto put in force, and which they propose to continue, is most complete in details, as it has proved effective in practice. The systematic character of the arrangements throughout contrast very satisfactorily with the intermittent efforts which have been made by the local authorities over the greater part of the country to arrest the progress of infectious diseases of stock. Most prominently in the report stands the scheme of division into districts. The county of Middlesex, for the purposes of the Act, is arranged in seven districts, each one comprehending several parishes; over each district a veterinary inspector, who is a qualified veterinary surgeon, is appointed. The rates of remuneration are calculated according to distance, and travelling expenses are limited to threepence per mile each way. Inspectors are required to make returns to the committee from time to time, and the present report contains tabulated statements of the number of cases of infectious disease which have come under the observation of each inspector from the passing of the Act to March 25th of the present year. At page 11 of the report we read:—"Your committee have thought it desirable that Southhall

Market, into which they had reason to believe that large numbers of diseased cattle were introduced, and from thence spread disease throughout the country, should be inspected. They therefore detailed two of their inspectors for this particular weekly service, and they have reason to believe that, owing to this inspection, a fruitful source of disease has been stopped." We do not doubt the truth of this conclusion, any more than we doubt the existence of wide-spread mischief all over the country from neglect of this obvious precaution. Equally true is the suggestion which we meet with a little further on :—"Your committee, in conclusion, beg to point out that, in their opinion, much of the spread of disease (particularly that of foot-and-mouth) is attributable to the careless disregard, on the part of owners of stock, of the provisions of the law, which imposes upon them the necessity of reporting cases of disease and taking subsequent precautionary measures with respect to cattle affected ; and they are further of opinion that the only remedy for this state of things is to be found in the imposition of severe penalties upon the offenders who evade the law." To all the executive committees, and they are many, who believe that their duties are well done when they cause to be printed an Order of Council, and deem that policemen are competent veterinary inspectors, we commend the report before us; they will rise from its perusal wiser if not happier men.—*The Field.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

THE PHYSIOLOGY OF VIRUS AND VIRULENT MALADIES.

By M. A. Chaveau.

(*Continued from p.* 373.)

True virulent maladies, in the state that I shall show that science has actually arrived, should be considered entirely distinct from parasitic affections. Their intimate and essential cause does not at all reside in the development of the proto-organisms which produce the septic or septicoid diseases to which I have alluded, or of every other of the numerous parasitic being which, from the acarus to the psorosperm, may live and multiply at the expense of man

and animals, causing more or less marked pathological ravages. That certain virulent maladies predispose to parasitism is another question which we shall examine, because its discussion forms part of our programme. That between the pathological action of the parasitic proto-organisms, and that of the agents to which we will attribute the cause of virulence, there are certain analogies, shall be shown in the comparisons which will often be made. That it is, at present, rash to affirm that the progress of science will not one day show in these analogies characters of identity I am the first to admit; but, in the meantime, that this identification should be accepted as a proved fact, or even as a simple probable fact, you will unhesitatingly deny when you shall have followed me in the experimental demonstrations that I am about to offer you.

The contagious maladies which have not parasitism for cause and means of transmission—such is, then, the domain of the virulent maladies, properly so called. It is in this domain that we will exclusively take the examples and the facts which we require for our study. And in order that we be not deceived, we shall leave on one side all the diseases situated on the frontier of this domain, and as to whose exact place there may be doubt or uncertainty. On this point the greatest reserve is imperiously demanded; for it must not be forgotten that the general domain of contagious maladies themselves cannot be, at present, sharply defined. Let it be remembered that for certain diseases, which have been known from the remotest antiquity, contagiousness has only been fully accepted in our own days. Finally, do not overlook the fact that many affections have been alternately introduced into the list of contagious maladies and removed from it; that even now the question as to whether such a malady is or is not contagious gives rise to the most animated discussions. Evidently all this uncertainty should disappear. The extension that the application of the experimental method to the study of these questions is destined to receive should, on this point, confer a rapid progress on science.

By the way, we shall have occasion to indicate some of these diseases. But it is necessary to take things as they are, for such is the actual state of affairs that one is forced to make a limited choice of examples in the list of maladies whose theory we have to establish. We shall, therefore, only take sure examples, some borrowed from human, the others from veterinary pathology—the latter the most numerous, because they are better adapted for experimental demonstrations.

The diverse types shall be chosen in such a manner as to represent all the forms of virulent maladies—from those with local or *quasi*-local manifestations, as blennorrhagia and simple chancre, to those which implicate all the body, as glanders and syphilis, whose anatomical manifestations affect the majority of the organs.

Determination of the proper agents to which the Virulent Faculty belongs.

Given some virulent malady, what is there in it which renders it capable of being communicated to healthy individuals? Every one knows that this faculty of transmission is owing to the fact that the diseased organism manufactures more or less considerable quantities of *virus*, which it gives off, mediately or immediately, to healthy organisms. Everybody also knows that, generally, a *virus*, the action of which on the latter gives rise to a disease identical with that which engendered itself, is multiplied in certain humours which constitute its vehicle. Many diverse substances enter into the composition of this vehicle. To find in this complex medium the elements which play the part of the *virus*,—that is to say, the essential agents of contagion, the virulent or infecting principles—this is the fundamental subject which ought to be the object of our primary studies. If we contrive to determine very exactly these viruliferous elements we shall have made a considerable step in the theory of viruses. This determination even compels us to submit the virulent agents to all the procedure of the precise researches which have been introduced into the natural sciences. We may thus make a physiology of virus, as of any other element of the organism. May our means of study be sufficient, and enable us to bring this physiology to the desired degree of perfection, so that the theory of virulent maladies shall be established on the widest and most solid basis.

(*To be continued.*)

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF THE COUNCIL, 28TH MAY, 1872.

PRESENT: Professors Simonds and Brown; Messrs. Balls, Broad, J. C. Broad, Cartledge, Cartwright, Cowie, Dray, Field, Greaves, Harpley, Hunt, Silvester, Wilkinson, Withers, and the Secretary.

It was moved by *Mr. Hunt*, and seconded by *Mr. Harpley*, "That the late President take the chair."

Mr. Cartledge having taken the chair, letters were read from Professor Williams and Mr. G. Fleming, regretting their inability to attend the meeting.

The election of a President was then proceeded with.

It was moved by *Mr. Hunt*, "That Mr. J. C. Broad, of Paddington, be elected President for the ensuing year."

Mr. Silvester proposed Mr. Richard Pritchard, of Wolverhampton.

Professor Brown proposed Mr. M. J. Harpley, of the Royal Horse Guards.

On the ballot being taken, there were found to be for Mr. M. J. Harpley 7, Mr. J. C. Broad 6, and Mr. Richard Pritchard 3, upon which Mr. Harpley was declared duly elected.

Mr. Harpley having been conducted to the chair as President, and received the key of office, returned thanks for the honour of his election.

The election of six Vice-Presidents was next proceeded with.

The following gentlemen were proposed:

Colonel Fitzwygram,	proposed by	Mr.	Cartledge.
Mr. T. W. Mayer	,,	,,	Cartwright.
,, J. R. Cox	,,	,,	Field.
,, M. E. Naylor	,,	,,	Coates.
,, A. J. Owles	,,	,,	Dray.
,, C. Lowe	,,	,,	Coates.
Professor McCall	,,	,,	Hunt.
Mr. J. Woodger, sen.	,,	,,	Wilkinson.
,, A. C. Cope	,,	,,	Field.
,, W. F. Chattell	,,	,,	Cowie.
,, W. Wilson	,,	,,	Greaves.

On the ballot being taken it was found that there were for—

Mr. T. W. Mayer .	. 16 votes.
„ J. R. Cox .	. 14 „
Colonel Fitzwygram	. 11 „
Mr. M. E. Naylor .	. 11 „
„ Clement Lowe .	. 9 „
„ Alfred J. Owles .	. 8 „
Professor McCall .	. 8 „
Mr. J. Woodger .	. 7 „
„ A. C. Cope .	. 5 „
„ W. Wilson .	. 3 „
„ W. F. Chattell .	. 3 „

On a further ballot being taken for Professor McCall and Mr. Owles, each having obtained an equal number of votes, it was found that there were for Mr. Owles 12, and Professor McCall 6.

The election was declared to have fallen upon Colonel Fitzwygram, Messrs. Mayer, Cox, Naylor, Lowe, and Owles.

The election of a Secretary was then proceeded with.

Mr. Silvester proposed that Mr. Coates be re-elected Secretary.

On the ballot being taken, Mr. Coates was declared to be unanimously elected.

Mr. Hunt then proposed a vote of thanks to the late President for the able manner in which he had conducted the duties of his office during the past year. Carried by acclamation.

Mr. Cartledge returned thanks.

CENTRAL VETERINARY MEDICAL SOCIETY.

[OFFICIAL REPORT.]

THE usual monthly meeting of this Society was held on Thursday, June 6th, F. J. Mavor, Esq., V.P., in the Chair.

The further discussion of Mr. Mavor's paper, which had been adjourned from the last meeting, was entered upon. *Mr. Hunting* answered Mr. Mavor's reply, in doing which he said that he understood that equal temperature depended on nerve force alone; that blood was hotter in some parts, as in the hepatic vein, and where chemical changes occurred; that the further from the centre of circulation the cooler the blood, which was due to radiation from the surface of the body.

Referring to the operation of neurotomy in conjunction with an increase of temperature, he observed that our thoughts naturally refer to the division of the metacarpal nerve, a motory, sensitive, and sympathetic nerve, which is accompanied by an enlargement of the blood-vessels, which, in his opinion, accounted for the increase of heat, the bulk of blood being greater, asserting that had the artery been tied at the time coldness would have ensued. If nerve force preserved the fluidity of the blood, as Mr. Mavor stated, then the division of the metacarpal nerve should be the cause of coagulation of the blood in the foot that had lost that power.

Mr. Burrell, speaking of different nerves and their functions, wished to ask Mr. Mavor where the correlation takes place,—was it where heat was formed, or in the nerve centres? If not in the latter, of what use was the brain? and whether heat, as heat, had no action in rendering the blood fluid? observing that its fluidity did not depend on the so-called nervous ether.

Mr. Mavor, in reply to Mr. Hunting, said that surface radiation in animals was small, owing to the great quantity of hair, and that if the skin were to evolve the surplus heat, nature would scarcely have given animals such a non-conductor. If a thermometer be introduced beneath the surface, as in wounds, no greater temperature was found; greater heat he considered due to more rapid circulation. Also that the functions of the body depended upon the existence of nerve force, and that the secretions and excretions did not regulate the temperature of the body. To Mr. Burrell he replied that the brain is a director and not an eliminator, neither did it secrete.

Mr. Hunting wished to introduce the subject of local anæsthæsia. He was induced to do so from having read a statement in the *Animal World* that reflected upon the little use made of such means in the performance of operations. Whether ice or

ether be applied locally, the result is the same, and operations could be performed with but few struggles, but many of the operations being short and quickly performed, it was useless; it was further objectionable very often because of the reaction after operating, and the ill effects of the ether only. To fire a part after directly cooling it he deemed to be utterly useless.

The Chairman (Mr. Mavor) said,—Being the first to use æther spray, he found it succeeded very well indeed; it caused pain, when applied in neurotomy, to the nerve, which soon subsided. The greatest objection to it was its inexpediency, different seasons of the year rendering its adoption sometimes useless, hot weather being the only time. He stated that the conjunction with the alkaloids of ether and chloroform as a means of producing local anasthæsia was a question he had thought of trying by subcutaneous injection.

Votes of thanks were accorded to the Chairman and Mr. Hunting, after which the meeting dispersed. Members present, 13.

James Rowe, Junr., *Hon. Sec.*

THE SCOTTISH METROPOLITAN VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting was held in Cumming's Hotel, Lothian Road, Edinburgh, on Wednesday, 15th May, at 2 p.m.

Professor Williams, President, in the Chair.

Present: Messrs. Borthwick, Kirkleston; Aitken, Dalkeith; Balfour, Kirkcaldy; Baird, Cumming, and Aitken, Edinburgh; Waugh, Stirling; Brown, West Calder; Finlay, Royal Artillery, Leith Fort; Professor Walley; Mr. Black, Howgate; and the Secretary.

Professor Walley was elected a member; and Mr. Black, Howgate, proposed by *Mr. Cunningham*, seconded by *Mr. Borthwick*, as a member of the Society.

Mr. Borthwick's motion as to reading of essays and introduction of interesting cases at each meeting was adopted.

Mr. Aitken, Causewayside, Edinburgh, submitted to the inspection of the members a mare lame in the off hind leg, from an injury to the flexor metatarsi and extensor pedis muscles, presenting the peculiar symptoms shown in strain or rupture of these muscles.

Professor Williams, in commenting on the case, said that he

had lately had an opportunity of examining and of making a *post-mortem* examination of a well-marked case of this description occurring in the secretary's practice. The horse, working on a dunghill, became lame, and next morning was found with his near hind leg dangling in the air as if it was fractured. On being moved, however, it was found that he could stand well enough on the leg, but, whenever he attempted to draw it upwards, he seemed to have lost the proper power over it; it hung pendulous in the air, the hock remained unflexed, the tendons of the gastrocnemii muscles relaxed and flaccid, and the foot could be twisted up nearly to the end of the tail. When made to walk the foot was placed carelessly down and then jerked backward and upward in a convulsive way. The horse, being an old one, was killed, and an extensive rupture of the fibres of the flexor metatarsi and extensor pedis was found to have taken place, being on the anterior part of the former and on the posterior part of the latter muscle, midway between the stifle and the hock. Professor Williams stated that the most distinguishing symptom in such cases is the peculiar relaxed state of the gastrocnemii tendons. This arises, not, as has been supposed, from paralysis of these muscles, but from the loss of antagonistic force; the flexor metatarsi being powerless, there is nothing in front to counterbalance the action of the gastrocnemii behind.

Mr. Borthwick said that he had, a few weeks ago, attended a carriage horse one of whose hind legs had been entangled in a wire fence, and in the struggle to get free the muscles in front of the leg, a little above the hock, were nearly cut through. The general appearance of the leg and the state of the tendo Achillis was exactly similar.

Professor Williams went on to say that the late Professor Dick evidently had seen such cases and knew much about them, but he confounded them with strain of the gastrocnemii themselves, whereas in the latter case exactly opposite symptoms are exhibited; for it was rather a singular fact that about a week after the horse above mentioned was brought in, another horse came into the College yard with an injury to the gastrocnemii muscles, and at every step the leg was jerked forwards and upwards nearly against his belly; extreme extension of the hock in the one case, extreme flexion in the other, though in both the tendo Achillis is more or less relaxed. Milder cases, such as that now shown by Mr. Aitken, present modified symptoms; and unless the rupture was excessive, almost all, Professor Williams was of opinion, with time and rest might recover.

At the last meeting it was arranged that Mr. Hutcheon should

read a paper at this time, but having been unexpectedly called to take charge of a practice in Limerick he could not fulfil the engagement. In a letter to the Secretary, however, Mr. Hutcheon stated that had he remained in Edinburgh he intended to have made a few remarks on the "Therapeutic Action of Counter-irritants," and gave a sketch of the divisions of the subject. The members, while regretting that Mr. Hutcheon should have removed so far away from them, and expressing their best wishes for his future success, expressed a hope that at some future time it might be in his power to communicate the paper to the Society.

Professor Williams, at very short notice, kindly consented to supply Mr. Hutcheon's place, and read to the Society some very interesting remarks on "Inflammation of the Veins—local and general, and the effects of the introduction of Air and of Gas into the Circulation." Commencing with inflammation of the jugular vein after bleeding he described minutely the effects of inflammation on the coats of the vein, the process by which the clot or plug is formed, the various results—obliteration, abscesses, &c., and the treatment to be recommended in each; suggesting that the medical faculty might do well to try the effect of blistering in the human subject, seeing that it is so effectual in horse practice, —showing also that the seeming anomaly of inflammation of the vein, extending towards the heart in man and towards the head in the horse, depends really on the different veins operated on; citing as a very strong proof a case which he had been allowed by one of the Professors of the University to see, in which a man had attempted to cut his throat, and subsequently died from inflammation of the jugular veins, the inflammation extending not towards the heart but, as in the horse, towards the head. Glancing at diffused inflammation of the veins, the Professor described the causes and the appearances presented, remarking that in many cases of injuries terminating fatally and in which blame might be attached unjustly to the practitioner in attendance, he believed the unfavorable result was due not to improper treatment but to inflammation being excited in and becoming diffused throughout the ramifications of veins of the injured part. On the introduction of air or of gas into the circulation, Prof. Williams also made some very interesting remarks. He stated that about two years ago he had made, along with Mr. Hutcheon, some investigations and experiments on the subjects for dissection at the College to test one of the theories as to broken-wind. He found that, on blowing air into the vein or slowly introducing a solution of carbonate of soda, the effect was just the opposite of broken-wind; the horse drew in his breath with difficulty and expired easily, and in no case did he inspire easily or gulp down the air

at once, as it were, and then expel it with the slow action and "double-lift" of broken-wind.

The reading of the paper was followed by some friendly remarks from those present.

Mr. Borthwick related that on lately bleeding a lot of cattle, at the request of the owner, as a preventive to quarter-ill, &c., one of them, half an hour after being bled, began suddenly to run furiously round and round the court bellowing and foaming at the mouth, then fell into convulsions, and shortly after died. Mr. Borthwick wished to know whether this could be attributed in any way to the bleeding, or whether, as he supposed, it was a case of acute stomach staggers (of which there had been several in the neighbourhood) with which the animal had been affected previously, and which the excitement of bleeding had aggravated.

The members were unanimously of opinion that Mr. Borthwick's view was the correct one.

Mr. Aitken, Dalkeith, as showing how suddenly the entrance of air into the vein is sometimes followed by fatal results, stated that a coachman in his neighbourhood had bled one of his master's horses. Almost as soon as the vein was opened the horse threw up his head, reared and fell, and died almost immediately, the operator disappearing very rapidly.

Mr. Baird related also an interesting case showing the *post-mortem* appearances of broken-wind. A valuable hunter became "thick-winded," was put off work, treated, and got considerably better; but, getting two or three severe runs afterwards, he was found to be useless and ultimately shot. Mr. Baird opened the chest immediately afterwards and found the lungs filling the cavity, inflated with air, and with little bladder-like eminences on their surface; after a little these disappeared, and the lungs gradually and slowly collapsed.

The members after the meeting dined together, and spent a very cheerful and pleasant afternoon. Professor Walley consented to read a paper at the next meeting, to be held in August.

C. CUNNINGHAM,
Secretary.

ROYAL AGRICULTURAL SOCIETY.

The following report of this Society was presented to the half-yearly meeting recently held at the Society's Rooms, Hanover Square.

Our readers will observe that it contains matter of interest to the profession.

"Since the last general meeting in December, 57 members have died, and 144 members have withdrawn, or have been removed from the list by order of the Council; on the other hand, 2 governors and 157 members have been elected. The Society, therefore, now consists of: Life governors, 71; annual governors, 73; life members, 1655; annual members, 3953; honorary members, 14—making a total of 5766. The accounts for the year 1871 have been examined and certified by the auditors and accountants of the Society, and have been published, together with the Wolverhampton Country Meeting account, in the last number of the *Journal*. The funded capital of the Society remains the same as at the last half-yearly meeting, namely, the permanent Fund of £20,000 New Three per Cents., and the Reserve Show-fund of £4112 7s. 8d. New Three per Cents. In addition, the sum of £2000 lies on deposit with the Society's bankers, and the balance of the current account on the 1st inst. was £1595 3s. 6d., both these sums being available for defraying the expenses of the Cardiff meeting. The Earl of Leicestor has been elected a Member of the Council, to fill the vacancy caused by the election of Sir A. K. Macdonald, Bart., as a Trustee. The Cardiff Local Committee are co-operating with the Council to promote the success of the ensuing Country meeting. In conjunction with the Glamorganshire General Agricultural Society, they have added to the Society's Prize list offers of prizes for hunters and roadsters, as well as for agricultural and other classes of horses, for Castle Martin and other breeds of cattle, for Radnor sheep and for butter and cheese. Nineteen farms have been entered to compete for the prizes offered by the President, Sir Watkin W. Wynn, Bart., M.P., and by the Society for the best-managed farms in South Wales and Monmouthshire, and the judges have reported that after their first visit they were able to select such as were deserving of further examination. The prize list in connection with the Cardiff meeting has been further augmented by the Marquis of Bute and Major Picton Turbervill, who have offered prizes for plans of cottages suitable for agricultural labourers, to cost not more than £220 per pair, and for others suitable for the mineral dis-

tricts, to cost not more than £90 each. The conditions relating to certain classes of live stock have been under the careful consideration of the Council, and the following rules have been inserted in the prize sheet for the Cardiff meeting in place of those relating to the same classes which were previously in force:

"No cow will be eligible for a prize unless certified either at the date of entry, or between the date of entry and that of the show, to have had a living calf—or that the calf, *if dead*, was born at its proper time—within the twelve months preceding the date of the show.

"No heifer, except yearlings, entered as in-calf will be eligible for a prize unless she is certified to have been bulled before the 31st of March in the year of the show, nor will her owner afterwards receive the prize until he shall have furnished the Secretary with a further certificate before the 31st of January in the subsequent year, that she produced a living calf; or that the calf, *if dead*, was born at its proper time.

"No mare will be eligible for a prize unless certified either at the date of entry, or between the date of entry and that of the show, to have had a living foal—or that the foal, *if dead*, was born at its proper time, and in the year of the show—or in the event of a mare being exhibited *without* a foal at foot, a certificate shall be produced at the time of entry of her having been served, and the prize shall be withheld till a certificate be produced of her having produced a foal.

"In accordance with the scheme of rotation of districts recently arranged by the Council, the Country Meeting for 1873 will be held in the district comprising Northumberland, Durham, and the North and East Ridings of Yorkshire. Invitations have been received from the authorities of Darlington, Hull, and Newcastle, a Committee was appointed to inspect and report upon the sites, and other accommodation offered by the competing localities. After duly considering the report of this Committee, the Council have decided that the country meeting for 1873 shall be held at Hull. The Council have also to announce that the district which has been assigned for the country meeting of 1874 comprises the counties of Bedford, Cambridge, Essex, Hertford, Huntingdon, Norfolk, and Suffolk.

"The Governors of the Royal Veterinary College have appointed Professor J. B. Simonds to fill the vacancy in the office of Principal of the College created by the death of Professor Spooner. In consequence of this appointment Professor Simonds is unable to retain the post of Veterinary Inspector to the Royal Agricultural Society. The Council have resolved to make the usual grant to the Royal Veterinary College for the current year, on condition that one of the Professors of the Royal

Veterinary College be allowed to act as the Veterinary Inspector of the Society. The Governors of the College have accepted this arrangement, and have also agreed to the following schedule of Members' Veterinary Privileges:—

"I. *Serious or Extensive Diseases.*—No. 1. Any member of the Society who may desire professional attendance and special advice in cases of serious or extensive disease among his cattle, sheep, or pigs, will, on application to the Secretary, obtain the services of the Society's Veterinary Inspector, to visit the place where the disease prevails.

"No. 2. The remuneration of the Inspector will be £2 2s. each day as a professional fee, and £1 1s. each day for personal expenses; and he will also be allowed to charge the cost of travelling to and from the locality where his services may have been required. The fees and expenses will be a charge against the applicant; but this charge may be reduced or remitted altogether at the discretion of the Council, on such course being recommended to them by the Veterinary Committee.

"No. 3. The Inspector, on his return from visiting the diseased stock, will report to the Committee, in writing, the results of his observations and proceedings, which Report will be laid before the Council.

"No. 4. When contingencies arise to prevent a personal discharge of the duties confided to the Inspector, he may, subject to the approval of the Committee, name some competent professional person to act in his stead, who shall receive the same rates of remuneration.

"II. *Ordinary or other cases of Disease.*—Members may obtain the attendance of the Veterinary Inspector on any case of disease by paying the cost of his visit, which will be at the following rates, viz. £2 2*s.* per diem, and travelling expenses.

"III. *Consultations without visit.*—

Personal consultation with the Veterinary Inspector . .	5*s.*
Consultation by letter	5*s.*
Consultation necessitating the writing of three or more letters	10*s.*
Post-mortem examination, and report thereon .	10*s.*

"A return of the number of applications during each half year being required from the Veterinary Inspector.

"IV. *Admission of Diseased Animals to the Veterinary College, Investigations, Lectures, and Reports.*—No. 1. All members of the society have the privilege of sending cattle, sheep, and pigs to the Infirmary of the Royal Veterinary College, on the same

terms as if they were members of the College, viz. by paying for the keep and treatment of cattle 10*s*. 6*d*. per week each animal, and for sheep and pigs 'a small proportionate charge to be fixed by the Principal according to circumstances.'

"No. 2. The College has also undertaken to investigate such particular classes of disease, or special subjects connected with the application of the veterinary art to cattle, sheep, and pigs, as may be named by the Council.

"No. 3. In addition to the lectures now given by the Professor of Cattle Pathology to the pupils in the Royal Veterinary College, on special occasions the College undertake that one of the Professors shall also deliver such lectures before the members of the Society, at their house in Hanover Square, as the Council shall desire.

"No. 4. The Royal Veterinary College will authorise their Principal to furnish to the Council, quarterly, a detalied report of the cases of cattle, sheep, and pigs treated in the Infirmary, and also special reports from time to time on any matter of unusual interest, which may come under the notice of the College.

"The Council have also to announce that they have appointed Professor Simonds Consulting Veterinary Surgeon to the Society. The Agricultural Education examination was held at the Society's rooms on the days from Tuesday, April 16th, to Saturday, April 20th, inclusive. Three of the candidates who entered at the proper time, and eight of those who entered too late for prizes, appeared and were examined. Of those who were eligible for prizes, Mr. T. S. Minton has gained a first-class certificate, the life membership of the Society, and the prize for agriculture, in which subject he passed a very good examination. Of the other gentlemen four passed, namely, Mr. Brown, Mr. Champion, Mr. Ashdown, and Mr. Elwell, who obtained first-class certificates, and the life membership of the Society. All these gentlemen have been students at the Royal Agricultural College at Cirencester."

STOCK ENTRIES AT THE CARDIFF MEETING.

THE following table shows the number of entries for this year as compared with the three previous years:

	Cardiff, 1872.	Wolverhampton, 1871.	Oxford, 1870.	Manchester, 1869.
Horses . .	314	246	203	384
Cattle . .	406	399	435	338
Sheep . .	383	444	548	461
Pigs . . .	190	178	199	132
Total . .	1293	1267	1385	1315

THE FOREIGN CATTLE MARKET.

At a meeting of the Court of Common Council at Deptford, on Thursday, May 16th, at which Mr. Alderman Besley presided,

Mr. Elias Davis called attention to a letter which had appeared in the *Times*, in which it was stated that the Corporation had a bill in Parliament for the purpose of compelling *all* foreign cattle to be sent to Deptford Market, and he asked the Remembrancer if that statement was true.

Mr. Lawley said that the *Daily News* on Monday also contained an article on this subject, which he believed consisted of a great many misstatements. He wished to know if it was true, as was alleged, that the charges at Deptford Market were higher than at other landing-places for foreign cattle.

The Remembrancer said there was not a word of truth in the statement that a bill such as that referred to was being promoted by the Corporation. He thought he could tell whence the rumour originated.

Mr. Rudkin, a member of the Cattle Markets' Committee, said there was no doubt where the report came from. An attempt was being made, and possibly a justifiable one, to set free the animals that under the schedule of the Act of Parliament were required to go to Deptford Market. Last year there were something like 56,000 beasts that came from Germany, and these, under the existing law, would go to Deptford Market. Some 34,000 of them came from Schleswig-Holstein. The season for these beasts coming to London had not yet arrived; it commenced about the beginning of July, and the arrivals numbered about 2000 or 3000 a week. There had been a strong attempt made in this country and abroad to get Schleswig-Holstein

struck out of the schedule, and, so far as the Corporation were concerned, they had taken no action, directly or indirectly, in the matter. The question was a most important one, because it affected the food supply of the metropolis and the price of meat; and when they found statements made such as those which appeared in the letter to the *Times*, to the effect that in consequence of these restrictions the price of meat had gone up considerably, it behoved them to see whether there was any truth in those statements. From the opening of the market till now 2272 beasts had been landed at it. The number in the corresponding period last year that came from Germany was over 6000, so that there was a falling off of something like 4000 beasts in the three months. But there had been an increase of sheep—from 15,000 to 44,000; and these came from France and Belgium, and not from Germany at all. The falling-off in the number of cattle had not been caused by the building of the new market—it had arisen from a desire to prevent beasts coming here with a view to induce the Government of this country to take off the restrictions which they had imposed. He would not express an opinion whether the restrictions should be taken off or not: it was a matter for the Government to consider whether they would let cattle come in free. He had no doubt the letter to the *Times* was written by the same gentleman who originated the paragraph in the *Daily News:* they seemed to come from the same source. He (Mr. Rudkin) knew the influences which had been at work; and the persons who had to do with the letter and the paragraph knew perfectly well when they wrote them that there was not a word of truth in them. They knew perfectly well that the Corporation had not applied, or thought of applying, for a bill, but it seemed to him the Corporation was to be made the stalking-horse for these regulations being taken off.

There was another point to which he wished to allude. It was said the charges at Deptford were excessive. That had been carefully gone into between the Corporation and the Government, and they had calculated very closely indeed as to what would be anything like a recouping charge for the Corporation. They had calculated on the basis of the animals that came to this country last year, and if the same number of animals were to come they would, as near as possible, recoup themselves, without leaving anything as a margin, but they found that in the first three months there had been a falling-off of beasts. Therefore their charges were not excessive in the interest of the Corporation. He would now look at them in the interest of the public. Their charge for a bullock was 5*s.*, for sheep 9*d.*, for calves 2*s.* 6*d.*, and for pigs 9*d.* At Odam's wharf, where the whole of the 34,000 beasts came last year and were slaughtered—a place certainly not to be compared

with Deptford Cattle Market; a perfect slough, scarcely even fit for the slaughtering of pigs—the charge was 10*s.* for bullocks against 5*s.* charged by the Corporation; but last year 34,000 beasts went there without let or hindrance. Again, taking the case of an animal that was landed at Thames Haven and was free to go anywhere, the charge for it from the time of landing till it found its way to a slaughter-house in London was 7*s.* 11*d.* If it went to Deptford the charge from the time it left the side of the vessel to the time it went to the slaughter-house door was 5*s.*, so that there was a difference of 2*s.* 11*d.* in favour of Deptford. If landed at Brown's wharf the charge was 6*s.* 11*d.*, which was 1*s.* 11*d.* more than that at Deptford. The statements in the newspapers had been circulated with the view of preventing animals going to the new Foreign Cattle Market, and it was desirable that persons on the Continent should be acquainted with the fact that the charges at that market were considerably less than those that were imposed upon animals that went free to Copenhagen Market.

With regard to Copenhagen Market, he might say that, at the instance of the Cattle Markets' Committee, some of the restrictions which were of a stringent character had been removed. In conclusion, the hon. member remarked that, alike as regarded comfort, convenience, and consideration for the health of the animals, Deptford Market was an honour to the Corporation and to every person who had had anything to do with it. He had great pleasure in telling the Court and the public the facts of the case, and he trusted persons connected with the trade would desist from making use of the Corporation in the way they had done.

Mr. Lawley expressed a hope that the press, which had inadvertently lent itself to the propagation of that which was false and injurious, would kindly give the same publicity, in justice to the Corporation, to the reply which had now been given to those statements.—*City Press.*

CONTAGIOUS DISEASES (ANIMALS) ACT.

SEVERAL deputations, accompanied by a large number of members of Parliament, waited on Saturday, June 15th, upon the Right Hon. W. E. Forster, M.P., for the purpose of representing the necessity which exists for amending the Contagious Diseases (Animals) Act, so far as regards the removal and slaughtering of cattle affected with disease. The deputations represented the North-Western English and Irish Cattle Trade and Farmers' Protection Association, the Liverpool Cattle Market Company, the Liverpool Abbatoir Company, the Liverpool Town Council, a public meeting of the inhabitants of Liverpool, the Cattle Trade and Farmers' Protection Association of Ireland, the Scotch Cattle Trade, and the City of Dublin and Drogheda Steam Packet Companies. It was requested, among other matters, that the foot-and-mouth disease might be exempted from the operation of the Act; that permission should be accorded to owners of cattle, upon the cattle being seized as affected with disease, to have them slaughtered at the nearest slaughterhouse; that provision may be made for the erection of slaughterhouses at every cattle market where one does not already exist, and for the licensing of such as already exist at cattle markets; that the practice of granting rewards to informers may be abolished; and that the power of the local authorities to inflict fines may be considerably reduced. Mr. Forster, in reply, said that Government had already considered the matter, and did not think there was a case for the exemption of the foot-and-mouth disease from the Act. The regulations in England, and the restrictions on cattle imported from Ireland, could not be relaxed without staying the regulations on foreign importations, and such a proposal would create great opposition. As regarded the erection and licensing of slaughterhouses at cattle markets, it seemed to him that that was an omission in the Act which should be remedied. As to permission to slaughter at the nearest slaughterhouse to the place of seizure, he thought a *prima facie* case had been made out, and he would see what their powers were; but he could not promise that they should be used in the way suggested by the deputations, as he would have to hear the statements on the other side.

Veterinary Jurisprudence.

COURT OF QUEEN'S BENCH, Westminster, June 20.

(*Sittings at Nisi Prius, before Mr. Justice* Hannen *and a Special Jury.*)

BETTYES V. DAVEY.

The plaintiff in this case sued for the price of a horse.

Mr. Murphy and *Mr. Wormald* appeared for the plaintiff; *Mr. Huddleston, Q.C.,* and *Mr. Barnard* for the defendant.

The plaintiff is a coachbuilder in Long Acre; the defendant is a gentleman living in Cornwall Terrace, Regent's Park. The defendant advertised for a horse, which resulted in communications between the plaintiff and defendant, and finally they agreed that the defendant should hire the horse for three months for £21, he having the option of purchasing it at the end of that time for £63. The horse was taken by the defendant on these terms, and was driven by him for about three months. At the end of that time some communication was made to the plaintiff which caused him to call on the defendant, and he, according to his evidence, found the horse in a very bad state, with sore heels and fetlocks and swelled legs, which he attributed to the negligent keeping and taking care of the horse by the defendant; he thereupon demanded the £63 of the defendant as the price of the horse, saying that he could not take him back under the circumstances. The defendant refused to pay the money or keep the horse without a warranty of soundness, as he attributed the unsoundness of the horse to lameness and disease which were present when he bought it. The defendant's coachman was during the three months taken up by the police for driving the horse while in an improper state. The charge was heard and dismissed on the defendant undertaking that this should not occur again. The defendant was unable, through illness, to look personally after his stable, and during the time that he had the horse it appeared to have been badly treated by the servant who was in his employment.

Mr. Huddleston stated the above on behalf of the defendant, who he said had been in ignorance of the manner in which the horse had been kept; and eventually a verdict was taken by consent for the plaintiff for £85.

THE BOTANICAL LECTURES AT THE ROYAL VETERINARY COLLEGE.

In reply to several inquiries we may inform the members of the profession in general that the Lectures on Botany have been supplemented throughout the summer session by weekly excursions into the country and practical demonstrations in the field, which have added much to their value, and enabled the students to master many of the details of the science not otherwise so easily attainable. The last of these excursions was made on Wednesday, June 26th, when, through the liberality of the London, Tilbury, and Southend Railway Company, the class, at the charge of 2*s*. per head only, was enabled to visit Southend accompanied by their teacher, Dr. Cobbold. This excursion was organized by Dr. Cobbold, chiefly for the purpose of bringing to the notice of the students examples of many marine plants with which the coast here abounds. The trip proved a most enjoyable one, mentally as well as corporeally, and was regarded by all as an appropriate ending of the first course of Botanical Lectures delivered at the College.

MISCELLANEA.

NOTES ON THE EFFECTS OF FROST ON TREES.

In the earlier volumes of the 'Philosophical Transactions' we read of freezing rain which fell in the west of England in December, 1672. This rain as it fell on the branches of trees immediately formed into ice of such a thickness, and icicles of such a size, as to break down the branches of our hardiest plants, while that which fell on the snow immediately formed into ice, without sinking into the snow at all. The destruction amongst trees was beyond anything known in history. The sprig of an ash tree weighing just three quarters of a pound, when covered with this ice weighed 16 lbs., and the noise of the clattering of the icy branches dashing against each other was so great as to create quite an alarm amongst the people. Yet strange to say, during this curious phenomenon, little or no frost was observed on the surface of the ground. This frost rain was followed by glowing heats, and a wonderful early development of flowers and fruit followed.—*Scottish Farmer.*

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VETERINARIAN.

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Communications and Cases.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 409.)

Euphorbiales.—*Euphorbial Alliance* come next in order for description. Its diagnosis is as follows:—

"Declinous Exogens, with scattered monodichlamydeous flowers, superior consolidated carpels, axile placentæ, and a large embryo surrounded by abundant albumen."—Professor Lindley.

The author just quoted has classed five natural orders in this alliance, but we purpose in this paper only noting the *Euphorbiaceæ* which are remarkable for their *definite suspended ovules and superior radicles.*

If we take our commoner representatives of the order we may describe the following genera:—

Euphorbiaceæ.—*Spurgeworts.* 1. *Euphorbia*—Spurges. 2. *Croton*—Crotons and Cascarilla. 3. *Ricinus*—Palmi-Christæ.

Bentham, speaking of the spurge family, says:—

"It is a vast family, chiefly tropical, so varied in aspect that no general idea can be formed of it from the three genera which represent it in Britain, nor is the connection between these three genera easily understood without a comparison with intermediate exotic forms. The structure of the ovary and fruit is peculiar to this family amongst unisexual plants."

A pervading character of the British Euphorbiums is the milky juice which exudes upon the puncture of any part of the plant. This juice possesses highly acrid stimulating qualities, and in some of the foreign species when dried it

forms a gum possessing the same characters as the milky juice itself.

Of British spurges Bentham describes twelve species, while Dr. Syme makes fifteen. Many of these are common weeds, but at the same time an attentive examination of their structure will well repay the inquirer.

The *Euphorbia Lathyrus*—Caperspurge—is a very handsome species which from long cultivation in gardens has become naturalised. It was grown for use in the same manner as capers. Dr. Pereira says: "The capsules are pickled and used as a substitute for capers, which they resemble in size, appearance, and pungency. When recent they are certainly acrid and poisonous; and it is probable, therefore, that the pickling process lessens or destroys their virulence; but the free use of the pickled fruits is dangerous."

All our wild species emit a thick milky juice on being broken, and the commoner sorts, *E. peplus*, dwarf spurge, *E. helioscopia*, sun spurge, and some others, are constantly appealed to by the rustic for the cure of warts, which is effected by merely touching the excrescences a few times with the exuding milk; it seems to act as a vegetable escharotic and vesicant. The exotic species contain most powerful medicinal principles. The *Euphorbia officinarum*, a most interesting cactiform plant, yields a drug known as "Gum Euphorbium," of which more anon.

The interest of the plant to the vegetable physiologists consists in its total absence of leaves, which organs are represented by a series of black spines which are placed at more or less regular intervals on a lobated cactus-like stem which is not only green and succulent, but is so covered with stomata that, as in the Cacti themselves, the stem seems to be modified to perform the leaf function. In this as in several of the species of our greenhouses what appears to be coralloid flowers are after all only coloured involucres, from the centre of each of which proceeds the stalked *ovarium*, consisting of three cells, each with a single suspended seed. Our common wild forms have the same structure, but being green and inconspicuous it escapes notice, whereas some foreign forms of Euphorbia and its ally *Poinsettia* are beautiful and flower-like rather from the surroundings of the floral organs than from the organs themselves. The gum from the *E. officinarum*, according to Pereira, is procured as follows:—

"The inhabitants of the lower regions of the Atlas range make incisions in the branches of the plant, and from these a milky juice exudes *which is so acrid* that it excoriates the fingers when applied to them. This exuded juice hardens by

the heat of the sun and forms a whitish-yellow solid, which drops off in the month of September and forms the Euphorbium of commerce. "The plants," says Mr. Jackson, produce abundantly once only in four years; but this fourth year's produce is more than all Europe can consume." The people who collect it, he adds, are obliged "*to tie a cloth over their mouth and nostrils to prevent the small dusty particles from annoying them, as they produce incessant sneezing.*" —*Materia Medica.*

We have marked the above passages with italics in order to show the acrid nature of this resinous gum.

Pelletier gives the following analysis of Euphorbium:

Resin	60·8
Wax	14·4
Bussorin	2·0
Malate of lime	12·2
Malate of potash	1·8
Water and loss	8·8
	100·0

Brande's analysis, which is more recent, is as follows, the difference probably arising to some extent from a difference in sample:

Resin	43·77
Wax	14·93
Caoutchouc	4·84
Malate of lime	18·82
Malate of potash	4·90
Sulphates of potash and lime, and phosphate of lime	0·70
Water and loss	6·44
Woody fibre	5·60
	100·00

No doubt the active principles reside to a considerable extent, if not wholly, in the resin, the leading and characteristic property of which, according to writers, is its intense acridity.

Powerful as is this drug, it has no place in the 'London Pharmacopœia,' though it is retained in that of Edinburgh, but we cannot find out that it is ever used. The 'Veterinary Pharmacist' seems to ignore it altogether; not so, however, the 'Farrier,' for our own experience teaches us that it is largely employed by the country druggist in making up "resaits" for these gentry, and there is too much reason to believe that powdered cantharides are much adulterated with euphorbium, and we think that unprincipled druggists may be found who use it largely in making blister plaster when cantharides should be wholly employed as the vesicant.

Dr. Pereira says, "Farriers sometimes employ it as a substitute for cantharides for blistering horses, but cautious and well-informed veterinarians are opposed to its use."

Such practitioners, then, as a rule should never trust the manufacture of a horse-blister out of his hands, and it would be well in making this useful application to procure sound flies in the whole state, and powder them at home.

We now describe the *Ricinus communis*, castor oil plant. This is an Asiatic-Indian plant, well known from very remote times for its medicinal qualities. It is cultivated in this country on account of its ornamental growth, its handsome palmate leaves and bold method of growing giving it quite a handsome appearance. We always grow a few by placing the seeds in pots in a hot-bed in spring, and transplanting them to the border in June. In warm summers it ripens its seeds, a few of which bruised have all the effects of castor oil.

Castor oil, the product of the seeds, is too well known and too extensively used to require minute description in this place. It is considered both for man and the lower animals a safe purgative medicine, and when good, effects its purpose with but little irritation; but, on the contrary, if made by processes in which heat is employed, as fatty acids are engendered thereby, and hence "cold-drawn castor oil" is to be preferred, which is simply made by expression. It has, indeed, been much disputed whether certain acrid principles which castor oil sometimes possesses are really contained in the seeds, or are the result of decomposition, and this points to the importance of obtaining oil as pure as possible, though we are far from recommending those perfectly colourless oils that have been bleached in the sunshine, for though they appear so much more attractive as to cause some people to believe that it has but a minimum of nauseous flavour, exposure to sunshine certainly augments this objectionable quality.

Croton tiglium is a tree of the order from the seeds of which the active medicine known as "croton oil" is derived, one drop of the oil being sufficient for a most active purgation. The plant itself is a native of the Indian Archipelago. It is used both as a purgative and a counter-irritant in numerous diseases of man and the lower animals.

Croton elutheria yields the cascarilla bark, which is used medicinally as a tonic and aromatic bitter, and on account of its fragrant smell on being burnt it has been used for smoking mixed with tobacco, but we have no evidence of its effects in this state.

Here, then, we may well conclude our short history of a tribe of plants which would require a large volume to elucidate all their interesting details, and it is not too much to say that although much has already been written upon the natural order, there are still many species which would amply repay a more extensive inquiry.

OVERSTOCKING COWS — OBSERVATIONS ON THE LATE TRIAL AT LEEDS.

By J. W. Hill, M.R.C.V.S., Wolverhampton.

I read with pleasure the communication from Professor Walley in our journal of last month on the subject of overstocking cows, in its especial relation to the late trial at Leeds. It is and ever has been in my opinion an act of cruelty to allow a cow's udder to become so distended with milk from long retention that the secretion is not only increased in temperature to a degree indicating fever, but that the contractile power of the duct being no longer sufficient to restrain it, it is forced out in that unhealthy condition named by Mr. Fearnley. However elastic the tissue may be that supports the mammary gland (and it is undoubtedly very elastic), this tissue must be strained far beyond its natural limits ere an overflow of milk can take place. I cannot, therefore, but think that any man who has one spark of feeling in his breast for the dumb animal which it is his privilege to own, attend or prize, and one whose valuable properties are far too great to be abused, must see, whether looking at it professionally or otherwise, that the system of overstocking cows, especially to the extent it is now carried on, is, without doubt, both unnatural and cruel. If custom is to decide such cases it is but of little use having a Society for the Prevention of Cruelty to Animals—a society whose aim it is to protect from unmerciful hands some of the noblest works of creation, and one which England has justly cause to be proud of.

If we look through veterinary jurisprudence generally, we may think the evidence of veterinary surgeons not perhaps so strong as it might be, and possibly, as a rule, the nature of the complaint or charge is not gone so fully into as when discussed amongst members of the profession themselves; however this may be, I thought Mr. Fearley's evidence, so far as it was reported, was clear and to the point—in fact, quite sufficient to establish the case as one of cruelty.

HINTS ON HORSES' HARNESS.

By Edwin Hill, M.R.C.V.S., Nottingham.

"A righteous man regardeth his beast, but the tender mercies of the wicked are cruel."

Custom is a perverse enemy to all advancement, and possesses no greater stronghold than it does among horsemen; thus the harness of horses, as now used, has made little progress as regards workmanship and embellishment, custom rebelling against any innovation (*i. e.* improvement).

Harness should be made as light as possible compatible with strength and durability, so as not only to lessen the burden of the horse but to allow greater comfort. The discontinuance of those large unsightly leathern collars, as formerly worn by agricultural and carriers' horses, is a step in the right direction.

There are many of the parts appertaining to a complete set of harness calling for reform; but as I shall only interfere with such portions where improvement suggests itself, my remarks will be confined, in this paper, to winkers, collars and bearing-reins.

Commencing with the smaller evil, I ask what benefit "winkers" confer on a horse other than enabling him to catch the dust in his eyes, and preventing him from seeing what he is doing. Custom will reply that if a horse is worked without winkers he will be affrighted when he hears the noise of and sees the vehicle behind him.

I cannot realise why a distinction is drawn between saddle and harness horses—why the latter should and the former should not wear them.

Admitting that you have more command over a horse when in the saddle than from the box, which is asserted to be the reason for the non-necessity of winkers in saddle horses; surely this should not subject a horse taken from riding and put to driving purposes (and many horses are as they advance in age) to the evil of being demi-blindfolded. How is it that in the Field Artillery, Army Service Corps and other branches of the service, that the lumbering guns and waggons with burnished accoutrements do not frighten him? And a field gun travelling over uneven ground at a rapid pace creates a considerable din. Why, from the absence of winkers the horse can see what is behind him and knows that it is an inanimate body, which will do him no hurt, having examined

it in his mind's eye before being harnessed to it, whereas had he winkers he would be ignorant of the true cause of the clatter and more likely to be frightened. I shall be told that these horses, being ridden, are consequently more under command; but are not all railway and many "bus" and cab horses worked without them? It would not be wise, except with very docile horses, to discard winkers where they have always been used; but would for the future "break in" horses for harness without them, thus giving the young horse confidence by allowing him to see what he is doing and in some measure to use his own judgment. What would be the fate of tip-horses employed in the formation of railway embankments and other works, if one was so blufted as not readily to see the waggon he was galloping along with, and unable to clear out of its way? He would sooner or later be overtaken by it and probably killed.

For some years past there has been considerable agitation against the use of bearing-reins, which has not caused a corresponding decrease in their use, which, perhaps, may be accounted for on the same principle as that clergyman understood who exhorted his hearers to do as he said and not what he did; for it occurs to me that a lady of good position, belonging to the Society of Friends and an advocate of the R. S. P. C. A. called upon me and left a small pamphlet treating of the cruelty inflicted upon horses by the use of bearing-reins, yet the animal in the carriage she was driving had its head constrained with, perhaps, as short a one as ever tortured a horse.

Tight and continued reining causes poll evil, strains to deep-seated ligaments and muscles, and paralysis of the portio dura nerve. It assists the causes productive of megrims, and induces vice—to wit, jibbing and rearing. This should be sufficient to discourage their use against anything that can be advanced in favour of their retention.

We are told that it gives contour to the neck; but where breed is lacking no bearing-rein can remedy the defect by putting an arched crest upon a ewe-necked animal.

Well, it keeps him up. Nonsense! A *horseman* keeps his eye warily upon the animal he is driving, and at the slightest trip reminds his charge by a slight sharp check, which has the effect, as "Stonehenge" says, not of keeping him up, but of making him keep himself up. The reins, being held easily, though not carelessly, can be tightened or elongated to the easement of the horse when going down or ascending hill, or to allow for the play of the head caused by the motion of his body. But the bearing-rein permits none of this.

Do not think that when you see a noble animal standing in a carriage, tossing its head and champing its bit, that it is its pride. No; he is endeavouring to obtain a moment's cessation to the pain inflicted by his head being thus constrained by the short rein.

If none of these arguments suffice for light harness, at any rate they should prevail for one class of horses. Any one who has noticed a heavy draught horse commence moving an exceedingly weighty load—and a better instance cannot be given than a shunting horse attached to several loaded railway trucks—to exert greater power the animal *lowers his head*, and almost crawls along the ground, and yet draught horses are universally provided with this rein, which is usually one of chain, to jealously guard against any tensile property a leathern one might possess. As in the case of winkers, I do not advise a general and immediate discontinuance of bearing-reins, as there are some sluggards who hang and depend on the bit, and would never go safely without them; but if all young horses were taught to work independent of them, there would be but few subjects—and those from some natural defect—that would be benefited by their use.

But there is still another important part of horses' harness requiring amendment, and that is the collar, and which, from being constantly pressed against the neck, interferes with the free return of blood from the head—in other words, induces apoplexy. Further, it impedes respiration, produces fistulous withers, poll evil, and other ills. Sore shoulders are of frequent occurrence, causing great inconvenience to their owners by throwing animals out of work (the real grievance), or otherwise ending in a prosecution. The substitution of the breast-strap would remedy most of the inconveniences of the collar. It affords greater surface for pressure, being thus less likely to produce galls, besides having its bearing upon parts less affecting the breathing and superficial circulation. Normandy horses, as used in our funeral corteges in our large cities, go well in them; then why not all horses?

The disuse of winkers and bearing-reins I am satisfied would be *no* loss. Of the abandonment of collars for breast-straps I have not had thorough opportunity of studying the result, and should like to know what, if any, cogent objections there may be to the general adoption of the breast-strap.

I may safely end this paper as I commenced it, by maintaining that custom alone retards improvements being made in horses' harness, and thus winkers, bearing-reins, and collars are still used.

IS ALSIKE CLOVER POISONOUS OR INJURIOUS TO HORSES?

By F. Earl, M.R.C.V.S., Shifnal.

Will you allow me to call the attention of the profession to a clover which is rapidly increasing in favour in this country, from the fact that it stands the winter better than other clovers. I allude to Alsike, which is regarded as intermediate in appearance between the common red clover and the white clover, and was, I believe, introduced into this country from the south of Sweden about thirty-five years ago. The question I wish to ask is this, "Is Alsike clover in its green state poisonous or injurious to horses or not?"

Without making a positive assertion, I am strongly inclined by recent observations to think that it is injurious. On May 13th I was called to see a bay cart-horse that had been lying out in some clover with other horses; the animal had appeared pretty well the previous day, but when the man went to fetch them up in the morning, he was so ill that the man had great difficulty in getting him home.

Symptoms.—The eyelids were tremendously swollen, the mucous membrane very much injected, and thick purulent matter flowed freely from the eye; the nostrils were all but closed by surrounding swelling; the front of the face from the muzzle up to the eyes had the appearance of having had a strong blister rubbed on it, and from the vesicles issued a thin yellow fluid resembling serum; the submaxillary glands were much enlarged, the legs swollen, and the horse had a stiff awkward gait, as though partially paralysed; the pulse was quick, weak and faltering, the mouth hot and feverish. I had the animal put into a loose box, and gave Nit. Æther. ʒij, Liq. Ammon. Acet. ʒiv, twice a day. The horse would eat nothing, but the thirst was very great. I ordered a powder consisting of Nit. of Potash ʒj, Pot. Bicarb. ʒij, to be given in a little cold water three times a day; this the horse freely drank; I also had the head well steamed and the legs bandaged; I followed up this treatment when the fever had subsided by giving vegetable tonics combined with a q
good old ale. On the 15th another horse was s uart of attacked, and on the next day three more. These im ilarlv treated in the same manner. The skin peeled comp were all the face of the first horse that was attacked, but no letely off the others; in little more than a week they had all t so with and were pronounced fit for work. For the last th recovered
ree n ights

they were brought into the stable, but after that were allowed to stop out altogether. In about nine days I was again sent for, when I found three of the horses suffering badly from glossitis; these were treated in the usual way, and all recovered. When I went to see the horses for the second time the waggoner told me that they had never done well since they were put on the clover (Alsike), and that in fact they would not eat it. This observation raised my curiosity and I went to examine the field; it consisted of about twenty-five acres, a capital crop of Alsike up to one's knees, but I found the waggoner's statement true—the horses *would not* eat it, but had gnawed every blade of grass up around the hedge side and even preferred eating the young shoots of the quick to the clover. I ordered a change of pasture, and the horses have done well since. The field was then stocked with a lot of fat sheep, and they, like the horses, did not care for the clover, but would wander round the hedge sides, picking up whatever they could get, and they also had to be removed. To further test the matter I have taken at different times my hacks to the field, and of course green meat is a treat to them, but after feeding greedily for a very short time they would not touch the Alsike, but wander round the hedge side just as the other horses had done. I have also heard of a well-authenticated case exactly similar to mine where horses feeding on green Alsike presented the same symptoms, and upon being removed to another pasture quickly recovered. My motive for bringing the matter under the notice of the profession is to elicit from my brethren proof either in support of or against my theory, because if I have fallen into an error it will not be the first one, and if, on the other hand, Alsike in its green state is injurious we ought to make it known to the public at large.

DISEASE IN PIGS.

By the Same.

Yesterday I saw about thirty store pigs suffering from a disease that I at least have never seen before. The first attacked was a sow that had been sent to the boar; when she came back she was noticed to be unwell, and subsequently all the rest of the pigs on the farm were attacked, with the exception of one sow which had a litter of pigs (twelve) about three weeks old, but although the sow has escaped, the young pigs are affected with the disease. The symptoms are great diffi-

culty in breathing, they make a wheezing noise like a man making a violent and prolonged inspiration; there is a good deal of fever, but they feed well, although they waste rapidly. The duration of the disease is about five days, but always before it subsides a considerable eruption breaks out behind the ears, the skin of which has the appearance of being cracked. The disease is not attended with any fatality.

CASE OF FRACTURE OF A COLT'S LEG.

By Haydon Leggett, M.R.C.V.S., Luton.

On Wednesday, May 15th, 1872, I was called to see a cart-colt, 2 years old, suffering from a fractured leg, at Mr. James Tribilcock's, Woodside Farm, Caddington, near Luton. On my arrival I found the colt had an oblique fracture of the near radius, situated about the centre of the middle third of the bone, caused by a kick from a nag mare.

I had castrated the colt in question a few weeks previously, and this was the first day of its going out to grass, it having recovered from that operation. Upon close examination of the limb I ascertained that the direction of the fracture was from above downwards and inwards, and that the sharp point of the lower half of the bone slightly protruded through the skin. This was caused by the leg dangling about, as the colt had walked on three legs a considerable distance from the meadow to a loose box. The owner was of opinion that it would be better to shoot the animal at once, as he thought "it would never do much good." I, however, stated my opinion that, considering age and all other circumstances, treatment would be successful, and the colt's ultimate recovery only a work of time and patience. To this the owner eventually consented.

I at once reduced the fracture, bound up the leg with pitch bandages, and had a stout piece of leather cut the shape of the forearm and laced it on in a similar manner to a man's shoe. This, however, did not answer so well as I had anticipated. On the following day I made a kind of mould out of a stout piece of leather, with a thin splint of iron riveted on the front, back, inside, and outside, which made it very stiff and firm. I then punched two rows of lace-holes outside from top to bottom, and filled up the uneven parts inside the leg with pieces of woollen bandages. After placing the two ends of the bone in apposition—an exceedingly troublesome and difficult process in an animal that had only

been haltered once before—and having put the leg in as natural a position as was possible under the circumstances, I proceeded to lace up the leathern case from the bottom to the top; having succeeded in this better than I anticipated, I placed the animal in the slings, administered plenty of sloppy food for a few days, and then gave a full allowance of corn and tares. There was a considerable amount of swelling for some days, and I had to loosen the leathern case on several occasions to regulate the pressure. The animal took to the slings very well, resting and sleeping in them for several hours at a time. At the end of three weeks I perceived that he rested with considerable weight on the injured limb, which he continued to do more and more every day.

Five weeks after the accident occurred he was released from the slings for a few hours in the day, and again placed in them at night. This was kept up for several days, when the assistance of the slings was dispensed with, as the colt could walk about tolerably well, and lie down and get up without any help.

I think that the bone began to unite the moment the ends were brought together, so well did the case progress. I called yesterday, July 11th, and saw the colt walk round the yard, to my great satisfaction, and not less to that of the owner. I have not the slightest doubt that when the colt has done growing there will be little or no difference in the apppearance of the front legs. At present, on account of the animal being in the slings entirely for five weeks, the fractured leg seems to be the strongest, it having been rested and the others unduly used in supporting the weight of the body.

I have sent these few remarks, not on account of the rareness of the case, or because I imagine myself able to do justice in recording it, but rather that they may stimulate some gentlemen in the veterinary profession to do likewise, through the medium of the *Veterinarian*.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of June, 1872, have been found to be affected with any Contagious or Infectious

Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Sheep-Scab .	...	14	...	...	14	14
Boulogne .	„	Foot-and-Mouth	...	63	...	...	63	63
Bremen .	Hull . .	„	...	74	...	...	74	74
Bremerhafen .	„	„	...	4	...	...	4	4
„	„	Sheep-Scab .	...	1	...	...	1	1
Cape Town	„	„	...	7	...	...	7	7
Coruña .	Portsmth. .	Foot-and-Mouth	3	...	...	...	3	3
Cronstadt .	Hull . .	„	3	...	...	...	3	3
Hamburg .	Grimsby .	„	...	...	...	63	63	63
„	Hull . .	„	78	40	...	...	118	118
„	London .	„	80	...	...	37	117	117
„	Middlesborough	„	9	9	...	...	18	18
Harlingen .	Hull . .	„	1	4	...	...	5	5
Nieu Dieppe .	„	„	4	...	...	...	4	4
Rotterdam	Harwich .	„	1	...	...	...	1	1
„	Hull . .	„	93	...	...	...	93	93
„	London .	„	6	...	...	...	6	6
Stavanger .	Harwich .	Sheep-Scab .	...	40	...	...	40	Reshipped to Norway
Vigo . .	Falmouth .	Foot-and-Mouth	28	...	...	...	28	28
Total . .		Foot-and-Mouth	306	194	...	100	600	600
„		Sheep-Scab .	...	62	...	...	62	22
Total . .			306	256	...	100	662	622

"ALEXANDER WILLIAMS,
Secretary.

"Privy Council Office,
"Veterinary Department, 11th July, 1872."

CATTLE PLAGUE.

The most noticeable fact in regard to cattle plague which we have to record is the discovery of infected animals in no less than three imported cargoes of Russian cattle within a few days of each other.

The first of these was a cargo of twenty-five Russian cattle from the port of Cronstadt landed at Deptford on Wednesday, July 17th. At the time of landing nothing particular was noticed in the condition of the animals; but it must be remembered that after a long voyage cattle naturally wear an aspect of lassitude; and, further, that Russian cattle do not commonly suffer so acutely from rinderpest as English beasts do. However, on the following morning, when the inspector arrived for the purpose of making a further examination of the animals, one of them lay dead, and on a post-mortem examination the characteristic lesions of cattle plague were detected. The slaughter of the rest of the cargo was at once commenced, but before it was completed the disease had begun to manifest itself among the remaining animals. On Friday morning, July 19th, the thermometer test showed that several of them gave evidence of a rise of temperature; in three of them the index stood at 105!

In consequence of this introduction of cattle plague, importation of animals from Russia was at once prohibited by Order of Council, a copy of which will be found in another part of our Journal.

Notwithstanding, however, the promptness with which the Government acted, it was too late to prevent the arrival of another vessel, which was known to be at sea with Russian cattle on board. This vessel, the "Binschie," also from Cronstadt, made the port of Leith during the night of July 21st, having a cargo of forty-eight beasts. On examination by the inspector, before the animals were landed, three were found to be suffering from cattle plague. These, with the healthy, were all slaughtered on board as quickly as possible, and so disposed of as to limit the risk of the introduction of the disease to a minimum.

Nor were these the only cases of diseased Russian cattle which have reached this country.

The "Brigadier" steam-ship arrived at about three o'clock in the morning of July 22nd at Newcastle-on-Tyne from *Hamburg*, bringing seventy German and eight Russian cattle from that port. One of the Russian beasts was ill at the time the cargo was discharged, and died in about four

hours afterwards. A second was found by the inspector to give indications of disease on his first examination. This was killed shortly afterwards, and both submitted to a careful *post-mortem* examination, which left no doubt of the animals being affected with cattle plague. It was ascertained that a third animal, also a Russian beast, had died at sea and been thrown overboard, and the evidence went to show that the symptoms of the disease were beginning to manifest themselves at the time the animal was embarked.

Unfortunately another case has to be added to the above. On the morning of the 28th the "Joseph Soames" came into Hull, having on board fifty-six Russian cattle, shipped also at Cronstadt. An inspection showed that two or three of the animals gave indications of the plague, and on inquiry it was ascertained that two others had died at sea and been thrown overboard. This case was investigated by ourselves, and at the time of our inspection the disease had so far extended that eighteen animals were found to be suffering from the disease in its different stages. We need not add that every precaution was taken to prevent any mischief resulting either from the cattle themselves or the merchandise which was on board the vessel.

The German cattle gave no evidence of cattle plague, but some of them were suffering from "foot-and-mouth disease." All were killed as quickly as possible, the diseased being dealt with according to law, and every precaution adopted to prevent the spread of the disease.

It is thus evident that cattle plague has extended from the Baltic Provinces of Russia, and from St. Petersburgh we learn that fresh outbreaks of disease have occurred in Novgorod, and that severe losses have been sustained in fourteen villages in the district of Krèstzi. No precaution appears to have been taken to prevent the spread of the malady.

Cattle plague is also reported to exist in Galicia, in Lower Austria near Vienna, in Scutari, and in Circassia, whence great fears are entertained of its spread to the Crimea.

France at last seems to be in a fair way of getting rid of the pest, as no fresh cases have been reported from the infected districts.

Belgium has been free from the plague for some months, and has accordingly been restored to her original position among scheduled countries by a recent Order of Council.

FOOT-AND-MOUTH DISEASE.

This affection is prevailing in many parts of the country in a virulent form, and the deaths among calves and also pigs have been unusually great. In some instances calves have died from the influence of the *materies morbi* in the system even before the ordinary symptoms of the malady have declared themselves.

These periodic outbreaks of foot-and-mouth disease are apparently becoming far more frequent. In times past, four or five years often passed without the disease being either unusually rife or virulent. The facts observed in Great Britain and Ireland with regard to more frequent outbreaks of the malady, seem to belong to Europe as a whole.

A deputation from the Royal Agricultural Society had an interview with the Vice-President of the Council a short time ago on this subject. The society complained of the introduction of diseased animals from Ireland, and regretted the laxity of action displayed in the cleansing and disinfecting of vessels. It appears that the society is about to undertake an inquiry into the subject, at the conclusion of which it is proposed to submit certain propositions for the consideration of the Government.

ROT IN SHEEP.

The *Pleasant Creek News,* Australian paper, says "that the affection known as 'rot' or fluke disease of sheep is attacking the sheep in the Wimmera district. It is said that in the Victoria Valley twenty or thirty of the diseased sheep are found dead daily on the camping grounds. The disease will not only reduce the stock terribly, but will have the probable effect of reducing the lambing by one third, besides causing a break in the wool, which will seriously militate against the price of the next clip. The rot, we are sorry to hear, is becoming general, and is fast travelling northward. There was a similar attack, we believe, sustained by the Wimmera flocks in 1863. The disease is generally observed after a wet spring, in cases where the subsequent heat causes the decay of vegetable matter."

Facts and Observations.

Worms in Sheep.—The *Pastoral Register*, Australian paper, regrets to hear that the plague of worms in sheep has again been officially reported. The details of the nature of the complaints are not satisfactory enough to justify the assumption that the disease has appeared in as virulent a form as last year, and, pending further particulars, we are not prepared to say that the disease under notice is prevalent.

Influence of Dr. Wright's Morphiæ Compounds on the Animal Body.—Some experiments on this subject were carried out by Dr. Reginald Stocker, Pathologist to St. Mary's Hospital, and are of interest. He says that doses of 1 decigramme of the compound $C_{68}H_{81}IN_4O_{10}, 4HI$ from codeia, and of the similar compound from morphia, were given to an an adult terrier by the mouth without producing any perceptible effect whatever; when the dose was increased to 3 decigrammes, in each case repeated defæcation in the course of a few hours was produced, the stools being more loose than ordinarily and frequently of a dark greenish colour; no other symptom was noticeable, and no appreciable difference in the action of the two compounds was perceptible. Doses of 5 decigrammes of the compound $C_{68}H_{82}I_2N_4O_{10}, 4HI$ from each of these sources were given to the same dog by the mouth, with the result of producing similar repeated defæcation in the course of two or three hours; the sole difference discernible between these and the former experiments being that the effect was produced somewhat sooner, and was of longer continuance in the latter cases, a result probably produced solely by the larger dose. No material differences were observed between the codeia and morphia derivative. The same dog was employed throughout, two or three days being allowed to intervene between each experiment, so that the animal had recovered from the effects of a former dose before the administration of another.—*Proceedings of the Royal Society*, April, 1872.

Bust of Dr. B. W. Richardson, F.R.S.—Mr. Davis, the sculptor, has completed a bust of Dr. B. W. Richardson, F.R.S. The likeness is admirable, and we trust that copies will be taken of it—say by the autotype process—so as to place within the reach of the profession the representation of one to whom medical science is under so many obligations.

THE VETERINARIAN, AUGUST 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

RE-INTRODUCTION OF CATTLE PLAGUE.

SEVEN years ago a great deal of discussion took place in reference to the origin of cattle plague in this country. A cargo of animals, exported from Revel, had been landed at Hull, and some of them transmitted to the Metropolitan Market, shortly before the disease was discovered among the cows belonging to Mrs. Nichols, at Islington; still, as the evidence did not directly implicate the imported Russians, the origin of cattle plague in England is to this day in many minds a problem yet to be solved.

No discussion is required, however, to establish the source of the disease in the recent instances to which we have elsewhere referred. No less than three cargoes of diseased Russian cattle have been detected within a few days; one in London, another in Newcastle-on-Tyne, and a third at Leith.

Two of the ships came direct from Cronstadt, and one from Hamburgh having eight Russian and seventy German beasts on board. Two of the Russian beasts presented well-marked indications of cattle plague, and one of them died within a few hours of the vessel coming into port. Stringent measures have been adopted to prevent any mischief resulting to the cattle of this country, which bid fair to accomplish this earnestly wished for result.

APPOINTMENT OF MEDICAL EXAMINERS.

AT the last meeting of the Council of the Royal College of Veterinary Surgeons, an animated discussion took place on the vexed question of the appointment of a member of the

medical profession to the vacant seat on the Examiners' Board. The vacancy had been created by the retirement of Professor Ellis, of University College, from the Anatomical and Physiological Section of the Court, and according to precedent, and also in harmony with the bye-laws of the College, his successor had to be sought in the ranks of the medical profession. Notwithstanding this, advocates were found who laboured to get rid, both of precedent and law, by one bold stroke; and the Council was asked by them to place a veterinary surgeon in the vacant chair. The old hackneyed argument, that the presence of members of the medical profession on the board conveyed the impression to the outside world of veterinary science being still in leading-strings, was never less effectively employed, for although perseveringly persisted in by one or two members, it fell listless on the ear of the majority.

We can admire professional independence, and will yield to none in our resolve to uphold the dignity of our calling; but we cannot, nevertheless, join in the clamour of Scotland for the Scots, and Ireland for the Irish. Each member of the Council must learn to take a comprehensive and liberal view of a question of this kind; for should a narrow and selfish policy ultimately predominate, all the efforts which the schools are making to raise the status of the profession will only end in disappointment, and we shall be sent back to the days of ignorance and barbarism.

We hear much of the necessity of veterinary science becoming a more effectual helpmate to the sister science of medicine, and we know that its worth and value in this respect are highly appreciated and eagerly sought by those who hold a distinguished position in the scientific world. If, then, this be an object worthy of attainment, where, we may ask, can this be more effectually accomplished than by such a union as now exists at the Examiners' Board? Here that hydra-headed monster—presumption—will be kept in subjection, nay, more, be encircled in fetters, and handed over to execution. A man to be an examiner, must possess something beyond mere knackerman's anatomy and blacksmith's physiology. We lack efficient examiners in our pro-

fession, because we lack schools and teachers. We do not choose members of the medical profession as examiners merely because they are such, but because they are distinguished either as anatomists, physiologists, histologists, or chemists, as the case may be, and have a reputation which is not confined to their own town or country. The names they bear cannot fail to give additional weight and influence to the diploma which sets forth that its possessor has been examined, and found to be efficient in the several branches of his scientific education.

When the newly-made veterinary surgeon returns to his native town, is it nothing for him to show a diploma which bears the same names as are to be found on that possessed by the highly esteemed surgeon of the place? Will it be likely that he will suffer thereby, or be looked down upon by those who seek his services? or that he will get the cold shoulder from his brother in science, although his practice may rank somewhat higher? No! here will be found another bond of union between the two professions, and one which it should be the policy of those in authority to strengthen with all their might and power.

THE ROYAL AGRICULTURAL SOCIETY AT CARDIFF.

The Annual Exhibition of the Royal Agricultural Society took place this year under favorable auspices. An excellent site, fine weather, and a most hospitable reception, combined to render the meeting a success.

Fortunately, the sanitary state of the animals exhibited was satisfactory; beyond common ailments there was nothing to attract attention or necessitate precautions. With the view to prevent the introduction of foot-and-mouth disease into the show yard, all the cattle were examined at the entrance gate, and the sheep and pigs also were submitted to such an inspection as their confined position in pens rendered possible.

A communication was addressed to the Local Authorities of Cardiff, inquiring what steps had been taken by them under the 57th Section of the Contagious Diseases (Animals) Act to provide for the reception of diseased animals which might be detected outside the show yard, and the reply was most satisfactory; the local inspector, Mr. Moir, veterinary surgeon, was instructed to take charge of all animals dealt with in contravention of the Act, and under this gentleman's directions all the required measures of precaution were adopted.

In order to provide for the isolation of animals which might be attacked in the show yard, a shed was erected at a point quite remote from the animals in the yard, but happily was not brought into requisition.

The exhibition of stock was up to the average. Agricultural horses were in considerable force, and among them some good animals were shown. The hunters were not a very satisfactory class, and the roadsters still less so.

It would be difficult to write anything new or particularly instructive respecting the cultivated herds of cattle, sheep, and pigs; in all varieties the culminating point of artificial excellence would seem to have been reached.

We subjoin a list of the awards.

LIST OF AWARDS.

HORSES.

Class 1.—Agricultural stallion foaled before the 1st of January, 1870 (not qualified to compete as Clydesdale or Suffolk). 1st prize, 25*l.*, the Fylde Cart-horse Breeding Improvement Company, of Singleton, Poulton-le-Fylde, Lancashire. 2nd, 15*l.*, Coates Sharpley, of Kelstern Hall, Louth, Lincolnshire. 3rd, 5*l.*, Thomas Statter. jun., of Stand Hall, Whitefield, Manchester.

Class 2.—Agricultural stallion foaled in the year 1870 (not qualified to compete as Clydesdale or Suffolk). 1st prize, 20*l.*, Frederick Thomas Bryan, of Humberstone, Leicester. 2nd, 10*l.*, Joseph A. Summer, of Debdale Farm, Mansfield, Notts. 3rd, 5*l.*, William Davies, of Mardu Llandrinio, Oswestry.

Class 3.—Clydesdale stallion foaled before the 1st of January, 1870. 1st prize, 25*l.*, Robert Orange, of Bedlington, Morpeth, Northumberland. 2nd, 15*l.*, Edward and Alfred Stanford, of Eatons, Ashurst, Steyning, Hurstpierpoint, Sussex. 3rd, 5*l.*, Thomas Statter, jun., of Stand Hall.

Class 4.—Clydesdale stallion foaled in the year 1870. 1st prize, 20*l.*, George and William H. Botham, of Wexham Court, Slough, Bucks. 2nd, 10*l.*, Thomas Statter, jun., of Stand Hall, Whitefield, Manchester.

Class 5.—Suffolk stallion foaled before the 1st of January, 1870. 1st prize, 25*l.*, Charles Boby, of Alton Hall, Stutton, Ipswich, Suffolk. 2nd, 15*l.*, William Byford, of The Court, Glemsford, Suffolk.

Class 6.—Suffolk stallion foaled in the year 1870. 1st prize, 20*l.*, Charles Boby, of Alton Hall, Stutton, Ipswich, Suffolk.

Class 7.—Thoroughbred stallion, suitable for getting hunters. 1st prize, 50*l.*, James Moffatt, of Kirklington Park, Carlisle, Cumberland. 2nd, 25*l.*, John Rees, of Llanboidy, Whitland, Carmarthenshire. 3rd, 10*l.*, Major J. Simpson Ballard, of the Verlands, Cowbridge, Glamorganshire.

Class 9.—Pony stallion, not exceeding fourteen hands high. 1st prize, 15*l.*, Henry Roundell, of the Queen's Head Hotel, Otley, Yorkshire. 2nd, 10*l.*, Tom Llewellyn Brewer, of Danygraig, Newport, Monmouthshire.

Class 10.—Pony stallion, not exceeding thirteen hands. 1st prize, 15*l.*, The Marquis of Bute, of Cardiff Castle. 2nd, 10*l.*, John Andrew Doyle, of Plas-Dulas, Abergele, Denbighshire.

Class 11.—Agricultural mare, in foal, or with foal at foot, not suitable to compete as Clydesdale or Suffolk. 1st prize, 20*l.*, Edmund Crowe, of Denver, Downham Market, Norfolk. 2nd, 10*l.*, Frederick Street, of Harrowden House, Bedford. 3rd, 5*l.*, John Lamb and J. Cowper Bowstead, of Penrith, Cumberland.

Class 12.—Clydesdale mare, in foal, or with foal at foot. 1st prize, 20*l.*, Thomas Statter, jun., of Stand Hall, Whitefield, Manchester. 2nd, 10*l.*, Richard Thomas, of Upper Court Farm, Margam, Taibach, Glamorganshire.

Class 13. Suffolk mare, in foal. or with foal at foot. 1st prize, 20*l.*, Robert Capon, of Dennington, Wickham Market, Suffolk. 2nd, 10*l.*, John J. S. Stone, of Scyborwen, Llantrissent, Newport. Monmouthshire.

Class 14.—Mare, in foal, or with foal at foot, suitable for breeding hunters. 1st prize, 25*l.*, William S. Cartwright, of Newport, Monmouthshire. 2nd, 15*l.*, Thomas Fox, of Avenham Hll, Poulton-le-Fylde, Lancashire. 3rd, 5*l.*, John Thomas Robinson, of Leckby Palace, Asenby, Thirsk, Yorkshire.

Class 15. Mare, above fourteen hands, and not exceeding fifteen hands one inch, in foal, or with foal at foot, suitable for breeding hackneys. 1st prize, 20*l.*, Alexander Sherratt, of Holdberry Farm, Occlepitchard, Hereford. 2nd, 10*l.*, Alban Watts, of New House, Coity, Bridgend, Glamorganshire. 3rd, 5*l.*, Thomas Tones, of Cross Lane Head, Bridgnorth, Salop.

Class 16.—Pony mare, not exceeding fourteen hands. 1st prize, 10*l.*, William Coates, of Scarborough Farm, Winchcombe. 2nd, 5*l.*, George Samuel Worthington, of Cardiff.

Class 17.—Pony mare, not exceeding thirteen hands. 1st prize, 10*l.*, William Allen, of Vaindre, Cardiff. 2nd, 5*l.*, Richard Travell, of Mount Stuart Hotel Docks, Cardiff.

Class 18.—Welsh pony, not exceeding thirteen hands (any age or sex). 1st prize, 10*l.*, John Thomas, of Church Street, Cardiff. 2nd, 5*l.*, Henry Bowen, of Spring Bank, Cardiff.

Class 19.—Agricultural filly, two years old, not qualified to compete as Clydesdale or Suffolk. 1st prize, 15*l.*, Henry Purser, of Willington Manor, Bedford. 2nd, 10*l.*, Edmund Crowe, of Denver, Downham Market, Norfolk. 3rd, 5*l.*, George Street, of Maulden, Ampthill, Bedfordshire.

Class 20.—Clydesdale filly, two years old. 1st prize, 15*l.*, George Hampton, of North End, Findon, Washington, Pulborough, Sussex.

Class 21.—Suffolk filly, two years old. No award.

Class 22.—Hunter (mare or gelding), up to not less than fifteen stone. 1st prize, 20*l.*, Frederick B. Jones, of Westall Court Farm, Cheltenham,

Gloucestershire. 2nd, 10*l.*, George William Griffiths Thomas, of The Heath, Cardiff, Glamorganshire. 3rd, 5*l.*, Major J. Simpson Ballard, The Verlands, Cowbridge, Glamorganshire.

Class 23.—Hunter (mare or gelding), up to not less than twelve stone. 1st prize, 20*l.*, Alfred Darby, of Stanley Hall, Bridgnorth, Salop. 2nd, 10*l.*, Henry Howell, of Coates, Cirencester, Gloucester. 3rd, 5*l.*, Francis Edmund Stacey, of Llandough Castle, Cowbridge, Glamorganshire.

Class 24.—Hunter (mare or gelding), four years old. 1st prize, 20*l.*, Charles Cook, of Taddington, Winchcombe, Gloucestershire. 2nd, 10*l.*, James Moffatt, of Kirklington Park, Carlisle, 3rd, 5*l.*, David Howell Thomas, of Derllys Court, Carmarthen.

Class 25.—Hunter (mare or gelding), three years old. 1st prize 20*l.*, J. M. Tattesall Musgrave, of Beverley, Yorkshire. 2nd, 10*l.*, Thomas Horrocks Miller, of Singleton, Poulton-le-Fylde, Lancashire. 3rd, 5*l.*, Henry George Allen, of 66, St. James's Street, London, Middlesex.

Class 26.—Hunter (gelding or filly), by a thoroughbred horse, two years old. 1st prize, 10*l.*, Thomas Horrocks Miller, of Singleton, Poulton-le-Fylde, Lancashire. 2nd, 5*l.*, Llewellyn and Henry Thomas, of Tydraw, Llantrithyd, Cowbridge, Glamorganshire.

Class 27.—Hunter (gelding or filly), one year old, by a thoroughbred horse. 1st prize, 10*l.*, Thomas Horrocks Miller, of Singleton, Poulton-le-Fylde, Lancashire. 2nd, 5*l.*, John Evans, of Pengam House, Cardiff, Glamorganshire.

Class 28.—Roadster (mare or gelding), about fourteen hands one inch, and not exceeding fifteen hands. 1st prize, 15*l.*, Thomas Goddard, of The Greenwood, St. Fagans, Cardiff, Glamorganshire. 2nd, 10*l.*, Bryan George Davies Cooke, of Colomendy, Mold, Flintshire.

Class 29.—Cob (mare or gelding), above thirteen hands, and not exceeding fourteen hands one inch. 1st prize, 15*l.*, Francis Edmund Stacey, of Llandough Castle, Cowbridge, Glamorganshire. 2nd, 10*l.*, William Harrys, of Canton, Cardiff.

Class 30.—Agricultural mare or gelding, three years old. 1st prize, 10*l.*, Thomas Townley Parker, of Charnock, Chorley, Lancashire. 2nd. 5*l.*, James Perry, of Salter's Hall, Claverley, Bridgnorth, Salop.

Class 31.—Agricultural mare or gelding, two years old. 1st prize, 10*l.*, Samuel C. Pilgrim, of The Outwoods, Hinckley, Leicestershire. 2nd, 5*l.*, Thomas W. D. Harris, of Wootton, Northampton.

Class 32.—Agricultural mare or gelding, one year old. First prize, 10*l.*, Frederic Street, of Harrowden House, Bedford. 2nd, 5*l.*, Edward Phillimore, of Prestbury Park Farm, Cheltenham, Gloucestershire.

Class 33.—Agricultural pair of geldings or mares, of any age. 1st prize, 20*l.*, Charles William Brierley, of Rhodes House, Middleton, Manchester. 2nd, 10*l.*, Charles W. Brierley, of Rhodes House.

Class 34.—Pair of draught geldings or mares, for underground purposes, not exceeding fifteen hands high (any age). 1st prize, 20*l.*, Thomas Statter, jun., of Stand Hall, Whitefield, Manchester.

CATTLE.

SHORTHORNS.

Class 35.—Bull above three years old. 1st prize, 30*l.*, John Outhwaite, of Bainesse, Catterick, Yorkshire. 2nd, 20*l.*, William Linton, of Sheriff Hutton, York. 3rd, 15*l.*, James Cooper Bowstead, of Hackthorpe Hall, Penrith, Cumberland. 4th, 10*l.*, Lieutenant-Colonel Loyd Lindsay, V.C., M.P., of Lockinge Park, Wantage, Berks.

Class 36.—Bull above two and not exceeding three years old. 1st prize

25*l.*, John Lamb, of Burrell Green, Penrith, Cumberland. 2nd, 15*l.*, George Garne, of Churchill Heath, Chipping Norton, Oxfordshire. 3rd, 10*l.*, Charles William Brierley, of Rhodes House, Middleton, Manchester. 4th, 5*l.*, Joseph Stratton, of Alton Priors, Marlborough, Wilts.

Class 37.—Yearling bull, above one and not exceeding two years old. 1st prize, 25*l.*, William Linton, of Sheriff Hutton, York. 2nd, 15*l.*, Alexander Henry Browne, of Bank House, Acklington, Northumberland. 3rd, 10*l.*, Colonel Charles Towneley, of Towneley, Lancashire. 4th, 5*l.*, Colonel Charles Towneley, of Towneley, Lancashire.

Class 38.—Bull calf, above six and not exceeding twelve months old. 1st prize, 15*l.*, Emily, Lady Pigot, of Branches Park, Newmarket. 2nd, 110*l.*, Colonel Charles Towneley, of Towneley. 3rd, 5*l.*, John Kersley Fowler, of Prebendal Farms, Aylesbury, Bucks.

Class 39.—Cow above three years old. 1st prize, 20*l.*, Alexander Henry Browne, of Bank House, Acklington, Northumberland. 2nd, 10*l.*, William Henry Hewett, of Norton Court. 3rd, 5*l.*, George Garne, of Churchill Heath, Chipping Norton, Oxfordshire.

Class 40.—Heifer in-milk or in-calf, not exceeding three years old. 1st prize, 15*l.*, Thomas Statter, Jun., of Stand Hall. 2nd, 10*l.*, Henry Frederick Smith, of Lamwath House, Sutton, Hull. 3rd, 5*l.*, Colonel Charles Towneley, of Towneley, Burnley, Lancashire.

Class 41.—Yearling heifer, above one and not exceeding two years old. 1st prize, 15*l.*, Colonel Charles Towneley, of Towneley. 2nd, 10*l.*, Joseph Stratton, of Alton Priors. 3rd, 5*l.*, Colonel Charles Towneley, of Towneley.

Class 42.—Heifer calf, above six and under twelve months old. 1st prize, 10*l.*, R. J. Maxwell Gumbleton, of Glanatore, Curryglass, County Waterford, Ireland. 2nd, 5*l.*, The Rev. Walter Sneyd, of Keele Hall, Newcastle-under-Lyne, Staffordshire.

HEREFORDS.

Class 43.—Bull above three years old. 1st prize, 25*l.*, Thomas Fenn, of Stonebrook House, Ludlow, and John Harding, of Bicton House, Shrewsbury. 2nd, 15*l.*, Philip Turner, of The Leen, Pembridge, Herefordshire. 3rd, 5*l.*, Richard Hill, of Orleton Court, Ludlow, Salop.

Class 44.—Bull above two and not exceeding three years old. 1st prize, 25*l.*, Joseph Evans Spencer, of Laneadle, Cowbridge, Glamorganshire. 2nd, 15*l.*, Edward Lester, of Cefn Ila, Usk, Monmouthshire. 3rd, 5*l.*, Richard Edwards, of Trewern Hall, Welshpool, Montgomeryshire.

Class 45.—Yearling bull, above one and not exceeding two years old. 1st prize, 25*l.*, William Taylor, of Showle Court, Ledbury, Herefordshire. 2nd, 15*l.*, John Harding, of Bicton, Shrewsbury. 3rd, 5*l.*, Her Majesty the Queen, Windsor Castle.

Class 46.—Bull calf, above six and not exceeding twelve months old. 1st prize, 10*l.*, Thomas Fenn, of Stonebrook House, Ludlow. 2nd, 5*l.*, William Tudge, of Adforton, Leintwardine, Herefordshire.

Class 47.—Cow above three years old. 1st prize, 20*l.*, William Burchall Peren, of Compton House, South Petherton, Somerset. 2nd, 10*l.*, Thomas Rogers, of Coxall, Brampton Brian, Herefordshire. 3rd, 5*l.*, Richard Tanner, of Frodesley, Dorrington, Salop.

Class 48.—Heifer in-milk or in-calf, not exceeding three years old. 1st prize, 15*l.*, Thomas Thomas, of St. Hilary, Cowbridge. 2nd, 10*l.*, Philip Turner, of The Leen, Pembridge, Herefordshire. 3rd, 5*l.*, Thomas Thomas, of St. Hilary, Cowbridge.

Class 49.—Yearling heifer, above one and not exceeding two years old. 1st prize, 15*l.*, Thomas Thomas, of St. Hilary, Cowbridge, Glamorganshire.

2nd, 10*l.*, John Morris, of Town House, Madley, Hereford. 3rd, 5*l.*, Thomas Fenn, of Stonebrook House, Ludlow.

Class 50.—Heifer calf, above six and under twelve months old. 1st prize, 10*l.*, Philip Turner, of The Leen, Pembridge, Herefordshire. 2nd, 5*l.*, Henry James Bailey, of Rosedale, Tenbury, Herefordshire.

DEVONS.

Class 51.—Bull above three years old. 1st prize, 25*l.*, James Davy, of Flitton Barton, North Molton, Devon. 2nd, 15*l.*, Viscount Falmouth, of Tregothnan, Probus, Cornwall.

Class 52.—Bull above two and not exceeding three years old. 1st prize, 25*l.*, Walter Farthing, of Stowey Court, Bridgwater, Somersetshire. 2nd, 15*l.*, Viscount Falmouth, of Tregothnan, Probus, Cornwall. 3rd, 5*l.*, Viscount Falmouth, of Tregothnan, Probus, Cornwall.

Class 53.—Yearling bull, above one and not exceeding two years old. 1st prize, 25*l.*, James Davy, of Flitton Barton, North Molton, Devon. 2nd, 15*l.*, John Jackman, of Hexworthy, Launceston, Cornwall. 3rd, 5*l.*, Her Majesty the Queen, Windsor Castle.

Class 54.—Bull calf, above six and not exceeding twelve months old. 1st prize, 10*l.*, James Davy, of Flitton Barton, North Molton, Devon. 2nd, 5*l.*, Walter Farthing, of Stowey Court, Bridgewater, Somerset.

Class 55.—Cow, above three years old. 1st prize, 20*l.*, John Azariah Smith, of Bradford Peverell, Dorchester. 2nd, 10*l.*, James Davy, of Flitton Barton, North Molton, Devon.

Class 56.—Heifer in milk or in calf, not exceeding three years old. 1st prize, 15*l.*, James Davy, at Flitton Barton, North Molton, Devon. 2nd, 10*l.*, John Azariah Smith, of Bradford Peverell, Dorchester.

Class 57.—Yearling heifer, above one and not exceeding two years old. 1st prize, 15*l.*, Walter Farthing, of Stowey Court, Bridgwater, Somerset. 2nd, 10*l.*, Trevor Lee Senior, of Broughton House, Aylesbury, Bucks. 3rd, 5*l.*, James Davey, of Flitton Barton, North Molton, Devon.

Class 58.—Heifer calf, above six and under twelve months old. 1st prize, 10*l.*, John Azariah Smith, of Bradford Peverell, Dorchester. 2nd, 5*l.*, Trevor Lee Senior, of Brompton House, Aylesbury.

JERSEY.

Class 59.—Bull above one year old. 1st prize, 10*l.*, Lord Chesham, of Latimer, Chesham, Bucks. 2nd, 5*l.*, Walter Gilbey, of Hargrave Park, Stanstead, Essex.

Class 60.—Cow above three years old. 1st prize, 10*l.*, Walter Gilbey, of Hargrave Park, Stanstead, Essex. 2nd, 5*l.*, George Simpson, of Wray Park, Reigate, Surrey.

Class 61.—Heifer, in milk or in calf, not exceeding three years old. 1st prize, 10*l.*, George Simpson, of Wray Park, Reigate, Surrey. 2nd, 5*l.*, Walter Gilbey, of Hargrave Park, Stanstead, Essex.

GUERNSEY.

Class 62.—Bull above one year old. 1st prize, 10*l.*, Charles Le Page, of Les Naftiaux, Guernsey.

Class 63.—Cow above three years old. 1st prize, 10*l.*, Robert Rendle, of Catel Farm, Guernsey. 2nd, 5*l.*, Charles Le Page, of Les Naftiaux, Guernsey.

Class 64.—Heifer, in milk or in calf, not exceeding three years old. 1st prize, 10*l.*, Robert Rendle, of Catel Farm, Guernsey. 2nd prize, 5*l.*, Thomas B. Le Page, of Maison de Bas, St. Andrew's, Guernsey.

WELSH BREEDS.

(Including the Castlemartin breed.)

Class 65.—Bull, three years old or more. 1st prize, 15*l.*, Walter Jenkins, of Glanwern, Talsarn, Cardiganshire. 2nd, 10*l.*, Henry Davies, of Typicca, Dryslwyn, Carmarthenshire.

WELSH BREEDS.

(Including the Castlemartin breed.)

Class 66.—Bull between two and three years old. 1st prize, 15*l.*, James Bevan Bowen, of Llwyngwair, Newport, Pembrokeshire. 2nd, 10*l.*, Richard Humphreys, of Royal Goat Hotel, Beddgelert, Carnarvonshire.

Class 67.—Yearling bull. 1st prize, 15*l.*, John Devonald Morse, of Glandawke, St. Clears, Carmarthenshire. 2nd, 10*l.*, Major John Heyward Heyward, of Crosswood, Welshpool, Montgomeryshire.

Class 68.—Heifer of between two or three years old. 1st prize, 15*l.*, Richard Humphreys, of Royal Goat Hotel, Beddgelert, Carnarvonshire. 2nd, 10*l.*, Thomas Evans, of Llwyngrawys, Cardiganshire. Reserve number and commended, Richard Humphreys, of Beddgelert.

Class 69.—Yearling heifer. 1st prize, 15*l.*, James Bevan Bowen, of Llwyngwair, Newport, Pembrokeshire.

CASTLEMARTIN BREED.

Class 71.—Pair of cows, over three years, in milk or in calf. 1st prize, 15*l.*, William Benjamin Roberts, of Loveston, Pembroke. 2nd, 10*l.*, Hugh Harries, of Vaynor, Narberth, Pembrokeshire.

OTHER ESTABLISHED BREEDS.

(Not including the Short-horn, Hereford, Devon, Jersey, Guernsey, or Welsh Breeds.)

Class 72.—Bull, above one year old. 1st prize, 10*l.*, Lord Sondes, of Elmham Hall, Thetford, Norfolk. 2nd, 5*l.*, Jeremiah J. Colman, M.P., of Carrow House, Norwich.

Class 73.—Cow, above three years old. 1st prize, 10*l.*, Lord Sondes, of Elmham Hall, Thetford. 2nd, 5*l.*, Richard Hemming Chapman, of Upton, Nuneaton, Warwickshire.

Class 74.—Heifer in milk or in calf, not exceeding three years old. 1st prize, 10*l.*, Lord Sondes, of Elmham, Thetford, Norfolk. 2nd, 5*l.*, Lord Sondes, of Elham.

Class 75.—Bull, cow, and their offspring, of any pure breed. 1st prize, 20*l.*, Warren Evans, of Llandowlais, Usk, Monmouthshire. Class very good.

DAIRY CATTLE.

Class 76.—Pair of Cows, over three years and eight months old, in milk. 1st prize, 15*l.*, John Williams, of Llantrithyd, Cowbridge, Glamorganshire. 2nd, 10*l.*, Joseph Evans Spencer, of Lancadle, Cowbridge. 3rd, 5*l.*, William Bradburn, of Wednesfield, Wolverhampton.

SHEEP.

LEICESTERS.

Class 77.—Shearling Ram. 1st prize, 20*l.*, The Rev. George Inge, of Thorpe Constantine, Tamworth, Staffordshire. 2nd, 10*l.*, John Borton, of Barton House, Barton-le-street, Malton, Yorkshire. 3rd, 5*l.*, Teasdale Hilton Hutchinson, of Manor House, Catterick, Yorkshire.

Class 78.—Ram of any other age. 1st prize, 20*l.*, The Rev. Geo. Inge, of Thorpe Constantine, Tamworth, Staffordshire. 2nd, 10*l.*, John Borton, of Barton House, Barton-le-street, Malton, Yorkshire. 3rd, 5*l.*, George Turner, of Bramford Speke, Exeter, Devonshire.

Class 79.—Pen of five shearling ewes of the same flock. 1st prize, 15*l.*, The Rev. George Inge, of Thorpe Constantine, Tamworth, Staffordshire. 2nd, 10*l.*, Teasdale H. Hutchinson, of Manor House, Catterick, Yorkshire.

COTSWOLDS.

Class 80.—Shearling ram.—1st prize, 20*l.*, The Executors of the late Thomas Gillett, of Kilkenny Farm, Faringdon, Oxfordshire. 2nd, 10*l.*, Thomas Brown, of Marham Hall Farm, Downham Market, Norfolk. 3rd, 5*l.*, Thomas Brown, of Marham Hall Farm.

Class 81.—Ram of any other age. 1st prize, 20*l.*, Thomas Brown, of Marham Hall Farm. 2nd, 10*l.*, The Executors of the late Thomas Gillett, of Kilkenny Farm. 3rd, 5*l.*, T. Beale Browne, of Salperton Park.

Class 82.—Pen of five shearling ewes of the same flock. 1st prize, 15*l.*, Thomas Thomas, of St. Hilary, Cowbridge, Glamorganshire. 2nd, 10*l.*, Christoper Spencer, of Gileston. 3rd, 5*l.*, James Walker of Northleach.

Class 83.—Pen of five cotswold ram lambs. 1st prize, 15*l.*, Thomas Thomas, of St. Hilary, Cowbridge, Glamorganshire. 2nd 10*l.*, Christopher Spencer, of Gileston.

LINCOLNS.

Class 84.—Shearling ram. 1st prize, 20*l.*, William and Henry Dudding, of Panton House, Wragby, Lincolnshire. 2nd, 10*l.*, Robert Wright, of Nocton Heath Lincoln. 3rd, 5*l.*, John Pears, of Mere.

Class 85.—Ram at any other age. 1st prize, 20*l.*, William F. Marshall, of Branston, Lincoln. 2nd, 10*l.*, Robert Wright, of Nocton Neath, Lincoln. 3rd, 5*l.*, John Pears, of Mere, Lincoln.

Class 86.—Pen of five shearling ewes of the same flock. First prize, 15*l.*, John Pears, of Mere, Lincoln. 2nd, 10*l.*, John Byron, of Kirkby Green, Sleaford, Lincolnshire.

LONG-WOOLS.

Class 87.—Pen of ten ewes, with their lambs, of any long wool bred. First prize, 10*l.*, John Williams, of Caeready, Cowbridge, Glamorganshire. 2nd, 5*l.*, Thomas William Daniel Harris, of Wotfon, Northampton.

OXFORDSHIRE DOWNS.

Class 88.—Shearling ram. First prize, 20*l.*, John Treadwell, of Upper Winchendon, Aylesbury, Bucks. 2nd, 10*l.*, A. F. Milton Druce, of Twelve Acres, Eynsham, Oxon. 3rd, 5*l.*, Charles Hobbs, of Maisey, Hampton, Cricklade, Wiltshire.

Class 89.—Ram of any other age. First prize, 20*l.*, George Wallis, of Old Shifford. 2nd, 10*l.*, John Treadwell, of Upper Winchendon, Aylesbury Buckinghamshire. 3rd, 5*l.*, Frederick Street, of Harrowden House, Bedford.

Class 90.—Pen of five shearling ewes of the same flock. First prize, 15*l.*, Charles Howard, of Biddenham, Bedford. 2nd., 10*l.*, A. F. Milton Druce, of Twelve Acres, Eynsham, Oxon.

SOUTHDOWNS.

Class 91.—Shearling ram. First prize, 20*l.*, Wm. Rigden, Hove, Brighton. 2nd, 10*l.*, William Rigden, of Hove. 3rd, 5*l.*, Colonel R. N. Fitzhardinge Kingscote, M.P., of Kingscote, Wotton-under-Edge, Gloucestershire.

Class 92.—Ram of any age. First prize, 20*l.*, William Rigden, of Hove,

Brighton, Sussex. 2nd, 10*l.*, William Rigden, of Hove. 3rd, 5*l.*, Lord Walsingham, of Merton Hall, Thetford, Norfolk.

Class 93.—Pen of five shearling ewes of the same flock. First prize, 15*l.*, Lord Walsingham, of Merton Hall, Thetford, Norfolk. 2nd, 10*l.*, Lord Sondes, of Elmham Hall, Thetford, Norfolk. 3rd, 5*l.*, Jeremiah James Colman, M.P., of Carrow House, Norwich.

SHROPSHIRES.

Class 94.—Shearling ram. First prize, 20*l.*, Lord Chesham, of Latimer, Chesham, Buckinghamshire. 2nd, 10*l.*, W. O. Foster, of Apley Park, Shifnal, Shropshire. 3rd, 5*l.*, John Evans, of Uffington, Shrewsbury.

Class 95.—Ram of any age. First prize, 20*l.*, Thomas Mansell, of Adcott Hall, Baschurch, Salop. 2nd, 10*l.*, Thomas Mansell, of Adcott Hall, Baschurch, Salop. 3rd, 5*l.*, Sarah Beach, of The Hattons, Brewood, Staffordshire.

Class 96.—Pen of five shearling ewes of the same flock. First prize, 15*l.*, John Hanbury Bradburne, of Pipe-place, Lichfield, Staffordshire. 2nd, 10*l.*, Lord Chesham, of Latimer, Chesham, Buckinghamshire. 3rd, 5*l.*, John Evans, Uffington, Salop.

HAMPSHIRE AND OTHER SHORT-WOOLS.

(Not qualified to compete as Southdowns or Shropshires.)

Class 97.—Shearling ram. First prize, 20*l.*, James Rawlence, Bulbridge, Wilton, Salisbury. 2nd, 10*l.*, James Lawrence, Bulbridge, Wilton, Salisbury. 3rd, 5*l.*, Robert Coles, Middleton, Norton, Bavent, Warminster, Wilts.

Class 98.—Ram of any age. First prize, 20*l.*, Alfred Morrison, Fonthill House, Tisbury. 2nd, 10*l.*, James Rawlence, Bullbridge, Wilton, Salisbury. 3rd, 5*l.*, Alfred Morrison, Fonthill, Tisbury, Wilts.

Class 99.—Pen of five shearling ewes of the same flock. First prize, 15*l.*, James Rawlence, of Bulbridge, Wilton, Salisbury. 2nd, 10*l.*, James Rawlence, of Bulbridge, Wilton.

DORSET.

Class 100.—Shearling ram. First prize, 10*l.*, Henry Mayo, of Cokers Frome, Dorsetshire, Dorset. 2nd, 5*l.*, Henry Mayo, of Cokers Frome.

Class 101.—Ram of any age. First prize, 10*l.*. Henry Mayo, of Cokers Frome.

Class 102.—Pen of five shearling ewes. First prize, 10*l.*, Henry Mayo, of Cokers Frome, Dorchester. 2nd, 5*l.*, Henry Mayo, of Cokers Frome.

CHEVIOTS.

Class 103.—Shearling ram. First prize, 10*l.*, John Robsom, of Bymess, Rochester, Northumberland. 2nd, 5*l.*, John Robson, of Bymess.

Class 104.—Ram of any age. First prize, 15*l.*, Robert Shortreed, of Attonburn, Kelso, N.B. 2nd, 5*l.*, William B. Buddicom, of Penbedw Hall, Mold, Flintshire.

Class 105.—Pen of five ewes of any age. First prize, 10*l.*, Robert Shortreed, of Attonburn, Kelso, N. B. 2nd, 5*l.*, John Robson, of Bymess, Rochester, Northumberland.

RADNORS.

Class 106.—Shearling ram. First prize, 10*l.*, Edward Farr, of Pilleth, Knighton, Radnorshire.

Class 107.—Ram of any other age. First prize, 10*l.*, Joseph Rawle Paramore, of Preswylfa, Neath, Glamorganshire. 2nd, 5*l.*, Edward Farr, of Pilleth, Knighton, Radnorshire.

Class 108.—Pen of five ewes of any age. First prize, 10*l.*, Thomas Dalton, of Crockherbtown, Cardiff. 2nd, 5*l.*, Thomas Dalton, of Crockherbtown, Cardiff.

WELSH MOUNTAIN SHEEP.

(Not qualified to compete as Radnors.)

Class 109.—Ram of any age. First prize, 10*l.*, Howell Harrys, of Crofta, Ystradowen, Cowbridge.

Class 110.—Pen of five ewes of any age. No entry.

PIGS.

LARGE WHITE BREED.

Class 111.—Boar above twelve months old. First prize, 10*l.*, James and Frederick Howard, of Britannia Farms, Bedford. 2nd, 5*l.*, Richard Elmhirst, Duckering, of Northorpe, Kirton-Lindsey, Lincolnshire.

Class 112.—Boar above six months and not exceeding twelve months old. First prize, 10*l.*, Peter Eden, of Cross Lane, Salford, Manchester. 2nd, 5*l.*, Matthew Walker, of Stockley Park, Anslow, Burton-on-Trent.

Class 113.—Breeding sow. First prize, 10*l.*, Peter Eden, of Cross Lane, Salford, Manchester.. 2nd, 5*l.*, James and Frederick Howard, of Britannia Farms, Bedford.

Class 114.—Pen of three breeding sow pigs of the same litter, above four and under eight months old. First prize, 10*l.*, Richard Elmhirst Duckering, of Northorpe, Kirton-Lindsey, Lincolnshire. 2nd, 5*l.*, Clement R. N. Beswick-Royds, of Pyke House, Littleborough, Lancashire.

SMALL WHITE BREED.

Class 115.—Boar, above twelve months old. First prize, 10*l.*, Peter Eden, of Cross Lane, Salford, Manchester. 2nd., 5*l.*, Clement R. N. Beswick-Rhoyds, of Pyke House, Littleborough, Lancashire.

Class 116.—Boar above six months and not exceeding twelve months old. First prize, 10*l.*, Peter Eden, of Cross Lane, Salford, Manchester. 2nd, 5*l.*, Peter Eden, of Cross Lane, Salford.

Class 117.—Breeding sow. First prize, 10*l.*, Peter Eden, of Cross Lane, Salford, Manchester. 2nd, 5*l.*. William and Henry Dudding, of Panton House, Wragby, Lincolnshire.

Class 118.—Pen of three breeding sow pigs of the same litter, above four and under eight months old.—1st prize, 10*l.*, Lord Rendlesham, of Rendlesham Hall, Woodbridge, Suffolk. 2nd, 5*l.*, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk.

SMALL BLACK BREED.

Class 119.—Boar above twelve months old. 1st prize, 10*l.*, Clement R. N. Beswick-Royds, of Pyke House, Littleborough, Lancashire. 2nd, 5*l.*' George Mumford Sexton, of Wherstead Hall.

Class 120.—Boar above six months and not exceeding twelve months old. 1st prize, 10*l.*, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk. 2nd, 5*l*,, William Mortimer Ware, of Newham House, Helstone, Cornwall.

Class 121.—Breeding sow. 1st prize, 10*l.*, George Mumford Sexton, of Wherstead Hall, Ipswich, Suffolk. 2nd, 5*l.*, George Mumford Sexton, of Wherstead Hall.

Class 122.—Pen of three breeding sow pigs of the same litter, above four and under eight months old. 1st prize, 10*l.*, George Mumford Sexton, of Wherstead Hall, Ipswick, Suffolk. 2nd, withheld.

BERKSHIRE BREED.

Class 123.—Boar, above twelve months old. 1st prize, 10*l.*, Heber Humfrey, of Kingstone Farm, Shrivenham, Berks. 2nd, 5*l.*, Thomas Radcliffe, of Cheswell Grange, Newport, Salop.

Class 124.—Boar above six months and not exceeding twelve months old. 1st prize, 10*l.*, The Executors of the late W. Hewer, of Sevenhampton. Highworth, Wilts. 2nd, 5*l.*, Lord Clermont, of Ravensdale Park, Newry, Ireland.

Class 125.—Breeding sow. 1st prize, 10*l.*, Richard Fowler, of Broughton Farm, Aylesbury, Bucks. 2nd, 5*l.*, Arthur Stewart, of St. Bridge Farm, Gloucester.

Class 126.—Pen of three breeding sow pigs of the same litter, above four and under eight months old. 1st prize, 10*l.*, Arthur Stewart, of St. Bridge Farm, Gloucester. 2nd, 5*l.*, John Biggs, of Cublington, Leighton Buzzard.

OTHER BREEDS NOT ELIGIBLE TO COMPETE IN ANY OF THE PRECEDING CLASSES.

Class 127.—Boar. 1st prize, 10*l.*, Clement R. N. Beswyeke-Royds, of Littleborough, Lancashire. 2nd, 5*l.*, Richard Elmhirst Duckering, of Northorpe. Reserve number, Francis Hart Dyke, of Acomb, York.

Class 128.—Breeding sow. 1st prize, 10*l.*, Peter Eden, of Cross-lane, Salford, Manchester. 2nd, 5*l.*, Peter Eden, of Cross-lane, Salford. Reserve number, Richard Elmhirst Duckering, of Northorpe, Kirton-Lindsey.

Class 129.—Pen of three breeding sow pigs of the same litter, above four and under eight months old. 1st prize, 10*l.*, Peter Eden, of Cross-lane, Salford, Manchester.

Extracts from British and Foreign Journals.

THE SLAUGHTER-HOUSE QUESTION.

The arguments against slaughter-houses in towns are so many and obvious that they seem at first sight to leave no room for anything that may be alleged on the other side. There is the cruelty to the animals in driving them through hot and crowded streets, the obstruction of thoroughfares, some amount of deterioration of the flesh, and the fact that blood, skins, bowels, and other refuse which easily becomes putrid, has to be carted out at the cost of fresh labour and fresh obstruction to the streets. We need not plead in mitigation, though it is a fact, that so perfect are the regulations laid down by the Metropolitan Officers of Health, and enforced by the local authorities of the metropolis, that the slaughter-houses are virtually inodorous and harmless. All the blood is received into vessels carefully closed, and so emoved at once; the skin and other offal are removed also

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in the night. No putrefying substance is allowed to enter the sewers, and the use of carbolic acid and constant white-washing render the well-kept slaughter-houses at the West-end less offensive than ordinary stables. They are licensed at a special yearly Court of Petty Sessions, and any infringement of regulations can be punished with forfeiture; and slaughtering without a licence involves a heavy fine.

Dr. Stevenson, in his report for the year 1871 of the health of St. Pancras, says that there are eighty-seven licensed slaughter-houses in that parish, and that they have been on the whole well kept, and few complaints made of them. He says that—

"Now, the entire removal of all the private slaughter-houses will undoubtedly be attended with many inconveniences, and these can only be met by the establishment of public *abattoirs* within easy distance of one another, in addition to the central *abattoirs* at present provided at the Metropolitan Market and elsewhere. Failing this, a wise course would be a more stringent application of the powers under which slaughter-houses are now licensed. . . All slaughter-houses should in any future legislation be required to be fifty feet from a dwelling-house. They should be properly constructed, well ventilated, well supplied with water, properly drained, the walls lined with glazed tiles, slate, or zinc, and they should have an impermeable floor of asphalte. Such a slaughter-house would be a great convenience to a district, and entail little more nuisance than a butcher's shop."

Dr. Stevenson is not disposed to allow existing slaughter-houses to be kept up, if within the above distance from dwellings; and argues that there would be no injustice in this, since the Metropolitan Building Act, 1844, expressly provides for the disuse of such places after August, 1874; and persons who have rented them, or who have taken places near them, have done so in the faith that the Act would be adhered to. Therefore, "to allow the present slaughter-houses to continue under existing restrictions, would be to put money into the slaughterman's pocket at the expense and loss of comfort of his neighbours." Bearing in mind what Dr. Stevenson has said of the inconveniences to which the 225,000 inhabitants of St. Pancras may be exposed if deprived of eighty-seven places in which food is prepared, we may see what choice of plans there is.

In the first place, Dr. Brewer proposes simply to repeal the clause of the Building Act which provides that existing slaughter-houses shall cease to be used as such in August,

1874. He argues that the Act which condemns them looks only to one reason, which does not now exist—viz., the fact that they are *nuisances;* and it classes slaughter-houses for the preparation of human food in the same category with knackers' yards for slaughtering diseased horses, firework manufactories, tallow-melters, and the like offensive trades. But, owing to good sanitary regulations, slaughter-houses, as Dr. Stevenson testifies, are not now offensive. Moreover, all political philosophy is founded not on the hope of an impracticable perfection, but on a balance of probable advantages; and whatever makes food dear and scarce may be more deadly than the effluvia of putrefaction. But not only meat spoiled in large quantities during hot weather by transport from a distance, and therefore made dear and scarce, but there is the *offal*—the *heads* and *plucks*, etc., which do not appear at the tables of M.P.'s, nor yet of sanitary philosophers, but yet form an important part of the food of the poor.* Moved by these considerations Dr. Brewer's Bill proposes simply to let things be.

A second plan is, not to allow of slaughtering at all times, but during the summer months only. Some would restrict the privilege to lambs, sheep, and calves.

The real objection to leaving things as they are is, that in many parts of London, under its present fragmentary, inactive, and inefficient government, private slaughter-houses may possibly be multiplied, and allowed to be established in the most improper places; hence that not only all the evils inseparable from well-kept places will exist, but there will be others, such as the preparation of diseased meat; and it will be recollected that some years ago even water-closets were used as slaughter-houses.

On the whole it occurs to us that the best plan would be to allow no new private slaughter-houses to be established in any large town; to limit the operation of existing slaughter-houses in populous neighbourhoods to sheep only; to establish more public *abattoirs* in convenient parts of the circuit of London or other towns; to make the Medical Officer of Health of each district responsible, and to require his signature to attest the fitness of all existing or proposed

* Any one who wishes to test this may go of an evening to Hollis's pork-shop in Oxford Street, and see the poor buy *faggots* at a penny apiece, with a ladleful of rich gravy. If any one asks, What are *faggots?* we pique ourselves on being able in answer to the *undederivatur*, to point to the Italian word *fegato—i.e.*, liver. These faggots are choice morsels of viscera and fat done up together and baked. If pigs were not killed in Oxford Street the poor could get no faggots. The place where the pigs were killed has—or had when we inspected it—a positively aromatic smell.

slaughter-houses; and to allow an appeal to the Local Government Board in any case of dispute.

But the final consummation to be aimed at is such an improved mode of killing and cooling the carcase as will allow dead meat to be sent any distance in hot weather. One of the largest butchers in London assures us that the flesh of animals quietly killed in Scotland, and allowed to *set* and become cool, is less liable to turn bad during its long transit than the flesh of animals hastily killed and imperfectly cooled is in being carted from a London *abattoir* to a butcher's shop five miles off.—*Medical Times and Gazette.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

GAZETTA MEDICO-VETERINARIA: DEDICATA AI PROGRESSI DELLA MEDICINA E DELLA CHIRURGIA DEGLI ANIMALI DOMESTICI.

We cannot but hail with pleasure the appearance of another Italian professional journal, making the fourth or fifth now being published in that country. Since its political regeneration and aggrandisement, Italy has been devoting itself with much energy and circumspection to the reformation of the different veterinary schools, and among these that at Milan has, through the interest of an illustrious statesman, been placed upon such a favorable and extensive footing as to be second to none in the kingdom. Under the superintendence of the distinguished Professor Oreste, and with a staff of highly competent veterinary teachers, the Milan school bids fair to assume a high rank among the medical educational establishments on the Continent. With such prospects before them, the directors and staff of the school have felt themselves in a position to undertake the publication of a journal as a means of expounding their own particular views with regard to the different subjects taught, and also to keep the members of the profession in Italy *au courant* with the progress of science in other countries. The *Gazetta* is published every two months, and to judge by the eight numbers now before me, it promises to be one of the best conducted and most valuable periodicals in veterinary literature. It is edited by Oreste, and the professor has for assistants in his work

Brambilla, Professor of Normal and Pathological Farriery; Corvini, Professor of Materia Medica, Therapeutics and Botany; Pavesi, Professor of Organic and Inorganic Chemistry; Generali, Professor of General Pathology and Pathological Anatomy; Sertoli, Extraordinary Professor of Veterinary Anatomy and Physiology; Vachetta, Professor of Surgery; with Assistant Professors Vietti, Moroni, Guzzoni, and Buonsanti. The original papers contributed by these gentlemen are generally of a high scientific order, and some of them, especially those relating to histology and anatomy, are of peculiar interest. Each professor furnishes, in addition, an analysis, more or less extensive, of the progress made in his own special branch of study in other countries; and in this way the *Gazetta* contains the newest and most noteworthy facts culled from foreign contemporaneous literature by writers well adapted for the work. To Dr. Guzzoni I am personally indebted for a very detailed and flattering analysis of my book on "Animal Plagues"—an analysis extending to no fewer than four numbers of the *Gazetta*. The doctor's matured scholarship, and his profound acquaintance with the literature of his profession, especially that pertaining to his own country, has enabled him not only to appreciate the magnitude of such a task, as well as its importance, but has also permitted him to favour us with some valuable notes relating to outbreaks of disease among animals from sources which were not available to me. This addition to our knowledge of epizoöties is most acceptable, and if the same course were followed for other countries, the unavoidable omissions I may have made would be amply compensated for, and the history of these diseases made complete.

The *Gazetta* is well printed, and, when necessary, illustrated; altogether, it is a periodical to be recommended to readers of the *Veterinarian* who are acquainted with the Italian language.

Strangles.

The opening article is from the pens of Oreste and Falconio on strangles, and is original.

Indicating the different names by which the malady is known, as "piccionaja," "barbone," and "stranguglioni" in Italy, "gourme" in France," "druse" in Germany, and "strangles" in England, while its Latin designation is "adenitis scrofulosa equorum," and "morbus glandulosus;" it is stated that the disease was known from the earliest times as common among horses, but rare in the ass and mule. Apsyrtus alluded to it; he says, "quum ineunte puerili

ætate primos dentes emittunt, aut cum protinus adultiores paullo secundos edunt, tunc strumosis collectionibus opportuniores visuntur. . . . armentariis pullis, qui non quintum vel sextum mensem excesserunt strumæ plerumque sic extuberant, et per inflammationem tumescunt, ut nec ullam herbam pascere nec matribus subrumari possint."

Vegetius Renatus also describes it in the second book of his work: "dum caput pullorum calefecerit prima dentitio, inter gingivas atque maxillas tumor collectioque generatur, quæ pulluria vocatur. Cujus passionis tanta tensura est, ut manducare vix possint. Sed cataplasmatibus studiosissime maturanda, deinde scalpello aperienda, post sale, et aceto, et oleo curanda." Carlo Ruini, Filippo Sacco, Fiaschi, Solleysel, Bourgelat, Paulet, Metaxa, Pozzi, Chabert, Boutrelle, Waldinger, Ryding, Veith, Funke, Blaine, Dietrichs, Robertson, Gilbert, and Rychner have been more or less diffuse in their description of it. Notwithstanding its antiquity and the many writers who have treated of it, modern pathologists are not entirely agreed as to a definition of the malady. Without entering lengthily into the various learned opinions on this point, that of Haubner is referred to. That authority believed it to be a lymphatio-catarrhal affection (*scrofulosa*) proper to the horse. Gleisberg supposed it to consist in an acute, and sometimes febrile, catarrh of the schneiderian mucous membrane, as well as of that of the frontal and maxillary sinuses, with inflammatory tumefaction of the submaxillary lymphatic glands, which may suppurate. According to Röll the "adenitis equina" consists in an acute catarrh of the nasal and sinus mucous membrane, with tumefaction and secondary acute inflammation of the submaxillary glands. Hering and Spinola consider it as a catarrhal lymphatic affection peculiar to the horse, and as being contagious and peculiar to young animals. Falke describes, but does not define the disease. Kraus adopts Röll's definition.

The various distinctions established by the different authorities with regard to the form, course, duration, &c., of the disease are then reviewed, and the authors give the preference to that given by Spinola, who distinguishes a *benignant form with a regular course*, and a *malignant form whose progress is irregular*.

(*To be continued.*)

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD THURSDAY, JULY 3RD, 1872.

Members present:—Mr. Ball, Mr. J. C. Broad, Mr. Cartledge, Colonel Fitzwygram, Mr. Fleming, Mr. Field, Mr. Greaves, Mr. Mr. J. Harpley, Mr. Lowe, Mr. Mayer, Mr. Moon, Mr. Owles, Mr. Pritchard, Professor Simonds, Mr. Wilkinson, Mr. Withers, and the Secretary.

M. J. Harpley, Esq. (the President), in the chair.

The Secretary read the notice convening the meeting.

The minutes of the two last meetings were read.

Mr. Wilkinson called attention to an omission in the minutes. The meeting in April was the first meeting subsequent to the death of two members of the Council (Professor Spooner and Mr. Robinson), and if he understood the charter correctly, substitutes in the place of those two members ought to have been elected at that meeting. Some statement should be made in the minutes as a reason why the custom had not been complied with.

Mr. Greaves said it was no doubt an omission. No doubt the real reason why the vacancies were not filled up *pro tem.* was because the Annual Meeting was then so near at which the fresh election would take place. It would no doubt be thought sufficient if it was shown on the minutes that Mr. Wilkinson had called attention to the omission.

Mr. Wilkinson said he was quite satisfied with that.

The minutes were then confirmed.

Letters were read from Professor Williams, Messrs. Cowie, Naylor, Burrell and Dray, regretting their inability to attend the Council meeting.

From Col. Fitzwygram, Messrs. Naylor, Lowe, Owles, Cox, and Mayer, acknowledging the honour of their election as Vice-Presidents.

From Mrs. Gabriel, of Torquay, presenting to the library eight volumes of books belonging to her late husband.

The thanks of the Council to Mrs. Gabriel were moved by *Mr. Broad*, seconded by *Mr. Fleming*, and agreed to.

Mr. Fleming presented a copy of his work on Rabies.

On the motion of *Mr. Wilkinson*, seconded by *Mr. Owles*, the thanks of the Council were accorded to Mr. Fleming.

Letter from Mr. Graham Mitchell, of Melbourne, suggesting that there would be a good opening for a veterinary school in Melbourne or Sidney, and offering to act as a corresponding member.

The Secretary was directed to refer Mr. Mitchell to the Central Veterinary Medical Association.

Letter from Mr. John Simpson, of Spartonbury, South Carolina, regretting that the Council considered the evidence insufficient to prove the destruction of his diploma by fire. He enclosed a copy of affidavit from the person in whose charge the diploma was said to be placed, and desired to be furnished with a certificate bearing the seal of the College.

Mr. Wilkinson said a copy of an affidavit was not a legal document, and could not be accepted by the Council.

Mr. Mayer said Mr. Simpson should be told to furnish the original affidavit.

The President asked if Mr. John Simpson was a member of the College.

The Secretary said he was. Mr. Simpson added, "If you do not consider the proof adequate, I shall feel that I have offered all that I consistently can, and shall endeavour to obtain the certificate through another and surer channel."

Mr. Wilkinson said that altered the features of the case. Having been threatened in this manner the Council ought to stand on its rights. He thought it beneath the Council to take any notice of this application.

Mr. Mayer moved that the Secretary be instructed to acknowledge the receipt of the letter, and request to be furnished with the original affidavit.

Mr. Lowe seconded the motion.

Mr. Wilkinson moved as an amendment that a letter be written to Mr. Simpson to say that, looking at the tone of his letter, the Council did not think proper to take any further steps in the matter.

Mr. Cartledge seconded the amendment, which was carried by nine votes to three.

Mr. Coates, on the motion of *Mr. Greaves*, seconded by *Mr. Lowe*, was unanimously re-elected Registrar.

The Finance Committee was re-appointed.

The Publication Committee was re-appointed, and Colonel Fitzwygram was added to it.

The Parliamentary Committee, with the substitution of Colonel Fitzwygram for the late Mr. Robinson, was re-appointed.

The House Committee was re-appointed, Mr. Broad being elected in place of the late Professor Spooner.

The Building Fund.

Mr. Mayer said that an erroneous impression had gone

abroad with regard to the sum deposited by himself in 1849, as a nucleus to a Building Fund. He never intended to withdraw it. At the Annual meeting he inquired whether it had been funded, and finding that it had not, he said that if it had been funded and had accumulated interest it would have amounted to something like £70, and as the lease of their house would soon expire he wished the Council to take into consideration the propriety of forming a distinct Building Fund, and to transfer this money to it as a nucleus to aid in the purchase of more suitable premises. They must all agree that it was absolutely necessary to have a building of a more permanent character, and more worthy of the Royal College of Veterinary Surgeons, and an appeal should be made to the profession on the subject. Probably the House Committee would undertake this question. They might open an account at the bankers for a Special Fund for building purposes, and when the proper time came and they had realized some funds he should propose that the sum of £37 14s. 7d., with accumulated interest, should be transferred to that fund. The Council having used the money for that period were in duty bound to add to it the interest, which would have accrued had it been placed in the funds. He should suggest that the Council request the House Committee to make inquiries on this subject, and draw up a prospectus and an appeal to the profession.

Mr. Greaves thought Mr. Mayer's proposal was fair and reasonable. He should be very glad to add his subscription towards the erection of a College that would be a credit and honour to their profession.

Mr. Fleming said the feeling at the Annual meeting was unanimous that they should have a better house for their College; but it was no use talking, they must be prepared to act. He should like to hear some definite motion on the subject.

Mr. Field understood Mr. Mayer to propose that the House Committee should draw up a prospectus and circular, and submit it to the Council. He should be very happy to second that.

Mr. Mayer said he would propose the following resolution: "That the sum of money given by myself with the interest on it be withdrawn from the General Fund and placed in a separate fund at interest to be applied in due time according to the intention of the donor; secondly, that the House Committee be requested to report on the subject of New Premises at their earliest opportunity."

Professor Simonds inquired where the terms of the original gift were to be found.

The Secretary said, in the Annual Report for 1850 reference was made to it.

Mr. Wilkinson moved as an amendment that the matter be referred to a Special Committee, consisting of Messrs. Ball, Cowie, Harpley, Withers, Broad, Mayer, Gowing and Field, with power to add to their number, to inquire into the terms on which the sum of £37 14s. 7d. was left in the hands of the College, by Mr. Mayer, and to report thereon.

Mr. Fleming seconded the amendment, which was agreed to.

The original motion was negatived.

Letter read from Professor Ellis, resigning the post of examiner in the R.C.V.S.

The Secretary stated that, by desire of the President, he had written to Dr. Taylor, informing him that Professor Ellis had tendered his resignation, and requesting him to name some eminent medical man who would be likely to fill up the vacancy, in order that the subject might be discussed at the next Council Meeting. A similar letter was addressed to Dr. Sharpey. Dr. Taylor wrote recommending John Birkett, Esq., Senior Surgeon at Guy's, and Dr. Sharpey recommended Professor Flower, Curator of the Hunterian Museum at the Royal College of Surgeons, and also Mr. St. George Mivart, F.R.S.

Mr. Greaves proposed, and *Mr. Fleming* seconded, that the resignation of Professor Ellis be accepted, though with regret.

The resolution was agreed to.

Mr. Cartledge said it was a subject of consideration some time ago whether any vacancies occurring in the Board of Examiners could not be more satisfactorily filled up by members of their own branch of the profession. This was a suitable time to consider how far it was necessary to appoint medical men, when these vacancies as they occurred could be readily filled up from their own ranks.

Mr. Wilkinson said such a proceeding would be contrary to the bye-law which prescribed that the Examining. Board should be composed of a certain number of medical men and a certain number of veterinary surgeons.

Mr. Withers suggested Mr. Callander, of St. Bartholomew's, as a candidate for the vacant office.

Mr. Fleming said that in their own profession they ought to stand upon the dignity of the profession as much as possible. The days had gone by when the profession in this country should be indebted to the medical profession for

examiners. Having been in existence some eighty years, if they were not in their own ranks able to furnish an Examiner on such an elementary subject as anatomy, they could scarcely hold up their heads in public. Anatomy was taught in a very elementary manner in their schools, there being no time to teach it thoroughly. He maintained there were men in their profession perfectly competent to examine students on the knowledge of anatomy they might have acquired in the short period during which they had studied anatomy. If they did not support their own profession, depend upon it they would not receive much encouragement from the public.

Mr. Greaves agreed that the time had come when they should cease to be in leading strings, especially at the tables of anatomy and physiology, pathology of the horse and pathology of cattle. At the chemistry table they might still continue to be indebted to the sister profession, but as to the other subjects, men might be found in their own profession more competent than the teachers at any of the medical schools.

Professor Simonds said he should be exceedingly sorry to allow one word to escape him which might be thought in any way to reflect upon the profession to which he belonged, but at the same time he could not sit quiet after the remarks that had been made. He could not accept the statement that anatomy was only superficially taught in the schools. They had a special professor of anatomy, namely, Mr. Pritchard, who certainly occupied a distinguished position in the profession, and was a very excellent anatomist. With regard to finding men in their profession to become examiners of anatomy, some members seemed to think that the profession as a profession stood in a very high position with regard to the sciences of anatomy, physiology, and pathology. The men who were most efficient in anatomy as veterinary surgeons were the men of yesterday. Once let men get into practice, and in a very short time they lost all knowledge of the details of anatomy, and unless a man had these details at his fingers' ends, he was of no use whatever as an examiner upon anatomy. Physiology could only be examined upon by physiologists, and he held that they as a profession were totally incompetent to examine students upon physiology. If this were so, and he challenged any individual present to deny it, they ought to look to a profession where they could find men ready to give their assistance as examiners upon anatomy and physiology. What they had hitherto to complain of was this, that the anatomists they had had knew

very little beyond the anatomy of the human subject. Professor Ellis was a man who when he was appointed became a veterinary anatomist, and it would be the bounden duty of any man appointed to this post to make himself acquainted with the anatomy of the lower animals. Professor Flower was one of the most celebrated comparative anatomists of the day, and his name attached to the diploma of the veterinary surgeon would carry more weight with it than a dozen names of the most eminent members of the veterinary profession. They had already upon that section of the court a veterinary surgeon who did examine upon the details of anatomy, namely, Mr. Pritchard, and he was perfectly sure that if they were to have two members of their own profession sitting at that one table as examiners upon anatomy and physiology, they would lose Dr. Sharpey's services directly, and, in all probability, the services of those men who were admitted to be in their right place at the chemical section of the Court. He appealed to the Council to earnestly consider the matter, and not to adopt a course which would certainly tend very much to the disadvantage of the profession.

Mr. Broad said he disagreed entirely from the notion, as stated by Mr. Fleming and Mr. Greaves, that they as a profession suffered from having to call in the aid of such eminent men as Dr. Sharpey, Professor Ellis, and others.

Mr. Wilkinson moved that Professor Flower be elected a member of the Examining Board in lieu of Professor Ellis.

Mr. Broad seconded the motion.

Mr. Pritchard supported the nomination of Professor Flower.

Mr. Greaves said he had listened with a good deal of attention to the argument of Professor Simonds, and with a wish to be converted by it, but he had not been so. He felt confident that Dr. Taylor and Dr. Sharpey were too reasonable and too sensible to take offence at what the Council in its deliberate judgment might do. He should propose that Professor Varnell be elected to the table of anatomy in place of Professor Ellis.

Professor Simonds said that Professor Varnell had retired from the profession altogether, and probably would not accept the office.

Mr. Owles asked whether, in their excessive humility, they might not be shackling themselves? If the members of the profession found that they were not expected to be equal to a certain duty, they might be pretty certain that they would not be found equal to it. If, on the contrary, they came to know that they were expected to be scientific

men, men possessing a knowledge of anatomy and physiology, they would qualify themselves to become efficient examiners at the Board.

Mr. Greaves then proposed that Colonel Fitzwygram be elected.

Colonel Fitzwygram said he did not think this could be discussed as an inside question; it was much more an outside question. There was no doubt that the world outside held the medical profession in higher estimation than they did the veterinary profession, and attached a far higher value to the diploma if it was signed by the most eminent medical men than they would if it was certified by the most eminently qualified veterinary surgeons.

Mr. Wilkinson appealed to Mr. Greaves to withdraw his proposition, as it would be very dangerous to take such a step at present.

The amendment having been withdrawn, Professor Flower was unanimously elected to the office.

The Report of the Examinations was then read.

Letter read from Dr. Dunsmure, asking the Council to provide anatomical and pathological specimens for the examiners' tables in Scotland.

The Secretary was instructed to reply that specimens would be supplied by Professor Williams and Professor McCall.

Letter from Professor Williams, requesting that the enclosed memorial from the professors of the Edinburgh Veterinary College might be laid before the Council.

The memorial was read and the discussion adjourned.

The Registrar read the obituary notices; also that 250 copies of the new register had been received from the printer.

Mr. Wilkinson proposed that a copy of the memorial from the Edinburgh Veterinary College should be sent to every member of the Council, and also one to Professor McCall.

Mr. Withers seconded the resolution, which was agreed to.

The Secretary reported that fresh copies of the bye-laws were required.

Ordered, that more be printed.

The Finance Report was read.

Mr. Wilkinson moved, and *Professor Simonds* seconded, its adoption.

Cheques were ordered to be drawn for the payment of current accounts.

Letter from Mr. James Rowe, of the Central Veterinary Medical Society, thanking the Council for the use of the

board room for holding their monthly meeting during the last twelve months, and asking the same favour from the Council for the next twelve months.

Mr. Withers moved that the use of the room be granted on the same terms as before.

Mr. Broad seconded the resolution, which was agreed to.

The Council then adjourned.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

The thirty-second quarterly meeting of the Liverpool Veterinary Medical Association was held in the Medical Hall, Hope Street, on Friday evening, the 10th day of May. After the members had partaken of tea the chair was taken by the President. There were present—Messrs. Storrar, Elam, Morgan, Reynolds, Kenny, Ackroyd, Harwood, Barnes, Welsby, Whittle, Woods, and Greaves, as members; and Messrs. Spearman, Middlehurst, Whitthread, Leyland, and Dr. Morris, as visitors. The Secretary nominated Mr. Little, and Mr. Kenny nominated Mr. Charles Middlehurst for membership of the Association.

After other business had been despatched, Mr. Joseph Welsby read the following paper on—"Cattle Poisoning by Phosphoric Acid," which was productive of an animated and highly useful discussion, relating principally to the form in which the poison was imbibed, and the chemical changes likely to take place on its admixture with the food and the juices of the stomach and bowels.

Mr. R. S. Reynolds also introduced, briefly and extemporaneously, the subject of "Sprained Tendons in Cart Horses," confessing his inability to prevent, in most cases, the horse eventually going on his toe. This difficulty was generally acknowledged; the treatment of firing was deprecated, unless it were associated with a special shoe and other mechanical appliances, which are pretty well known.. Tenotomy had not proved very successful.

William Chambers Lawson,
Hon. Secretary.

ESSAY ON CATTLE POISONING BY PHOSPHORIC ACID.

By Mr. Welsby.

A few weeks since I was requested to see some milch cows,

five in number. On arriving at the farm I was informed that they were apparently well the previous day. When I entered the shippon I was struck with their peculiar appearance: the ears were drooping, the head extended, tail elevated, breathing not accelerated, but evidently very painful, and accompanied with a moan or grunt so characteristic in rinderpest, and spasmodic action of the alæ nasi. The pulse was hard and frequent, the secretions generally scant, appetite lost, rumination suspended, coldness of the extremities, and the temperature of the body lowered. Injected membranes, great exaltation of the nervous system, excitation of the genital organs, and great thirst. The fæces were also voided frequently in small quantities and liquid.

I administered to each animal a dose of sulphate of magnesia, had them all warmly clothed, gave diluents in the shape of linseed tea and oatmeal gruel, followed by stimulants, such as carbonate of ammonia, spirits of nitrous ether, and strong ale.

Three of the animals recovered, and two died, of which I made a post-mortem examination. I found the rumen full; the contents had the usual appearance of such food as the cattle had taken. The epithelium of mucous membrane of the rumen in many places was detached, and peeled off on the application of the slightest force; but otherwise the membrane showed no remarkable appearance.

The abomasum contained about three quarts of semi-fluid food, the mucous coat of the stomach was congested in patches and softened, but there was no corrosion in either. In one case invagination of the small intestines was present.

The circulatory system was very much gorged. The contents of the rumen and abomasum had a strong acid reaction, and phosphoric and sulphuric acid were present in large quantities.

The mucous membrane of the rumen and the tissue of the abomasum yielded phosphoric acid and lime, and Mr. Whitthread, analytical chemist, of Liverpool, to whom I entrusted the analysis, concluded that death resulted from the animals having taken monocalcic phosphate, which is a body that we, as veterinary surgeons, do not often meet with; perhaps at least the name is strange to many of us. I may, therefore, be excused if I say a few words about it.

It is composed of one equivalent of phosphoric acid, two of water, and one of lime, and is a constituent of the superphosphates and similar artificial manures.

For the purpose of preparing superphosphate of lime, bones, bone ash, and certain minerals, consisting principally of the tricalcic phosphate, are selected, all of which are insoluble in water, and, therefore, cannot be assimilated by the plant. By long exposure

to the influence of the atmosphere they are rendered soluble, but a much quicker way of obtaining that object is to add sulphuric acid; the result of this mixture is monocalcic phosphate, and calcic sulphate or gypsum, the former being very soluble in water, and the latter slightly so. This is superphosphate of lime, which is now so much used in agriculture.

We have in this superphosphate (which is the only compound containing this monocalcic phosphate that would be likely to be found on a farm) sulphuric acid, which invariably contains arsenic, sulphate of lime, monocalcic phosphate, and insoluble matters. To which of these must we attribute the cause of death?

I think we may conclude that the insoluble matters and the small quantity of calcic sulphate or gypsum were not the cause.

Then was it arsenic? There were none of the characteristic lesions of the stomach and intestines, which occur even if arsenic had been absorbed by applying it to an open wound, or by otherwise introducing it into the system. The appearances are those of inflammation of the stomach, the mucous membrane being intensely red, coloured by extravasated blood, and the stomach generally containing ropy, bloody mucus.

Moreover, the small amount of arsenic present would not be sufficient to cause death.

Then, it may be said that the sulphuric acid used in preparing the superphosphate was not all combined, but some of it was free, and may have done the mischief. But when sulphuric acid is taken, it produces white or black excoriations of the buccal membrane, intense pain, thirst, difficulty in swallowing, painful efforts to cough, quick feeble pulse, cold skin, accelerated breathing, clammy sweats, and great weakness.

In the case under consideration there was no appearance in the mucous coat of the alimentary canal of those dark brown stains or corrosions so marked in sulphuric acid poisoning.

But the most conclusive evidence against the probability of sulphuric acid being the cause is, that there was present a large quantity of lime in a soluble condition, which is incompatible with sulphuric acid.

I think, therefore, we may safely conclude it was the monocalcic phosphate acting like dilute phosphoric acid which proved fatal.

It is a matter for consideration how these cattle took the poison; was it in their food or in their drink? Judging from the quantity found in the rumen, it must have been taken with the solids; the amount of fluid that finds its way into the rumen is very small compared with what passes onwards.

It may appear strange that cattle will take with their food a

compound like this superphosphate; but when I inform you that the better qualities are soft powders, with a slight acid flavour, and that they will consume readily large quantities of acid bodies, we cannot be surprised at their eating it when within their reach.

I am informed that they have been known to lick these superphosphate from the grass, as the men spread it on.

Although poisoning by phosphorus is unfortunately too common, very few cases of poisoning by phosphoric acid or phosphates have been recorded.

Common phosphorus is a powerful poison, as proved in two cases quoted by Dr. Christison, in the one a human being died in twelve days, after taking a grain and a half; in the other by two grains in eight days. According to Hertwig, the poisonous dose for a horse is from twenty to thirty grains.

Tabourin says that four grains in ʒij of oil injected into the jugular vein induce instantaneous death. Orfila says that in the dog from half a grain to a grain is sufficient to produce death, and that perforation of the stomach has occurred.

With the view to clear some obscure points, I made the following experiments on a goat, aged fifteen months, in moderate condition and perfectly healthy. Pulse 60. At nine o'clock in the morning I gave, in solution, 200 grains of superphosphate. At three in the afternoon the pulse had risen to 85. I then gave another dose of 200 grains, and repeated it again at ten o'clock in the evening. The following day I gave 200 grains three times, without any very apparent change. I continued with the same doses on the third day. Rumination was now suspended, appetite lost, temperature of the body lowered, breathing similar to that of the cows, pulse quick and weak, and the visible mucous membranes injected. On the fourth day there were signs of great prostration. I discontinued giving the superphosphate, and the animal died on the fifth day, so that in all 1800 grains of superphosphate were administered, containing 24 per cent. or 432 grains of monocalcic phosphate, or 17½ per cent., or 306 grains of phosphoric acid.

It is, therefore, not a very powerful poison; and when we consider how much the farmer is now dependent on this class of manure, it is very fortunate it is not.

The *post-mortem* appearances were very characteristic. On opening the body it was found to be gorged with blood, the heart (both sides), arteries, and veins, throughout the whole body being full. Excepting that the blood-vessels were very full, there was nothing remarkable about the brain or the lungs. The liver appeared to be enlarged, but otherwise there was nothing to note. The almost entire absence of internal fat was very conspicuous,

there being only one small portion of the omentum where any could be said to exist, and this was of a dirty yellow colour and very brittle, being more like bees' wax.

The rumen contained a large quantity of food, which was moist, having the consistency of wet provender. The epithelial covering of the mucous coat peeled with ease, completely and perfectly, in fact, it adhered with greater firmness to the food than the tissue; but in neither the tissue of the rumen nor its mucous coat was there any appearance of disorganization or of inflammation. It was, perhaps, a little whiter than normal. The second and third stomachs showed nothing particular, except the fulness of the blood-vessels. The abomasum contained about a pound of semifluid matter.

The mucous membrane was thickened and softened, and in places where the superphosphate was found adhering, there were patches in which it was removed, and in one spot the coats were so thin that the organ was almost perforated; there were other places where the lining membrane was absent, although I could see no superphosphate.

The bladder and intestines were quite empty of solids or fluids. A remarkable feature in the case was the peculiar condition of the blood; this was coagulated, and appeared as if the poison had a specific action on the fibrine. When the blood was removed from the body and put into a glass, on standing a short time a slimy deposit was found, which, on agitation, was diffused through the mass and again deposited.

The blood had an offensive odour, as though decomposition had set in. It was alkaline to test-paper, and contained an appreciable quantity of lime, and a very large excess of phosphoric acid. Examined under the microscope, I found that the red corpuscles had nearly disappeared. The white corpuscles were very transparent, and there was a large quantity of small masses of fibrous-looking material.

The most remarkable feature was the presence of crystals of phosphate of ammonia and magnesia in the blood.

When fibrine is decomposed it yields carbonic acid, water and ammonia, which was evidently the case in this instance.

It is a rare thing to find ammonia in blood; but here we must have had a large amount, because phosphate of ammonia and magnesia are only formed when a quantity of ammonia is present, and it is not surprising that where we find the fibrine so much acted upon that the corpuscles should also have been broken up, the enclosing membrane of which is apparently composed of coagulated fibrine, or albumen, or some similar body.

Dr. Taylor says there are few physiologists who doubt that all absorbed poisons act through the blood, and that they alter its physical or its chemical character, sometimes manifested by

an alteration in its consistency, or by a change of colour, the poisonous substance itself simultaneously undergoing a change.

Dr. Jackson, on examining the blood of a woman who had died from the inhalation of chloroform, found that the chlorine had been replaced by oxygen, and that formic acid existed in the blood, and this was separated from it by distillation. The chlorine had combined with the blood, which had lost the power of coagulation and of becoming red by exposure to air.

Admitting that every poison could be chemically detected in the blood, it would yet remain to be explained how it operated when there to destroy life. At present there is no satisfactory theory to account for the fatal effects. All we know from observation is, that the poison, when circulating through the blood-vassels, destroys life.

It has been supposed that when a poison has been absorbed it produces its effects by destroying the vitality of the blood; but all poisons do not act alike—one depresses the action of the heart, another affects the brain, a third the motor tract of the spinal marrow, and a fourth annuls the sensibility of the nervous system generally; therefore the destruction of the vital properties of the blood affords no explanation of these specific differences.

In the case now under consideration, however, we find distinct alterations of the fibrine, if not actual decomposition of the blood.

I had recourse to one other experiment on a goat, which was kept without food for twenty-four hours previously to the administration of the superphosphate.

It was subjected to precisely the same doses and given at the same time as the former instance, but in form of bolus. In this case the general disturbance was very slight, although the animal was never seen to ruminate.

After the death of the first one I administered to this large doses in solution, which produced death at the expiration of two days. The appearances on examination were exactly like the other.

From this I infer that the poison when administered in a solid form was not absorbed from the rumen, and the local action there produced was due to an acid salt on the coating of the rumen, which was powerful enough to disturb the vital functions, but not to corrode the tissue; and I also infer that in the abomasum the monocalcic phosphate was decomposed and the phosphoric acid set free, which was absorbed and caused the death of the animal.

A very animated discussion followed the reading of the paper.

Mr. Elam asked would not the monocalcic phosphate be converted into tricalcic phosphate in the presence of lime, and thus become insoluble; and was it not more likely that some phosphorus paste that had been intended to kill vermin had got spread over the pasture, where the cattle had been feeding, and in this way taken by them. He would also like to know if the monocalcic phosphate was decomposed, and only the phosphoric acid found in the blood, what became of the lime?

Mr. Welsby said he did not mean free lime when he spoke of lime in a soluble condition, but a soluble salt of lime; free lime would cause the change Mr. Elam mentioned. The cattle had not been out on a pasture, but in a shippon, and only five were affected, while several others remained healthy.

Mr. Whitthread said that he was familiar with the appearances produced by the phosphorus poisoning. In the case of these cattle there was nothing that he saw that was consistent with poisoning by phosphorus, or phosphorous acid, and he doubted the probability of phosphorus, under the circumstances suggested by Mr. Elam, being oxidized to phosphoric acid; besides which then we must account for the large quantity of phosphoric acid, and lime and sulphuric acid, which was found in the rumen and abomasum. He had not carried the investigation so far as to answer Mr. Elam's last question, but finding all the constituents of a superphosphate of lime in the rumen and abomasum, he concluded this caused the deaths; the experiments on two goats confirmed the opinion, and he was satisfied that he had attributed the deaths to the correct cause. It was reasonable to suppose that the calcic phosphate was decomposed before absorption, because he obtained monocalcic phosphate in the contents of the stomachs, and only phosphoric acid, probably combined with ammonia, in the blood.

LANCASHIRE VETERINARY MEDICAL SOCIETY.

The quarterly meeting of this Society was held at the Blackfriars' Hotel, Manchester, April 17th, 1872, the President, A. Lawson, Esq., in the chair.

The following gentlemen were present:—Messrs. Hopkin and Thomas Greaves, Manchester; W. Whittle, Worsley; Howell, Rochdale; J. B. Taylor, Ashton; M. Naylor, Wakefield; W. A. Cartwright, Whitchurch; Woods, Wigan; J. Lowe and Dalglish, Bolton; J. Taylor, Oldham; W. Dorber, jun., Pendleton; and the Secretary.

After the completion of some preliminary business, the President called upon Mr. Lowe, of Bolton, to address the meeting on the subject of "Parturition, particularly in the Cow and Mare."

Mr. Lowe, in directing attention to the subject, enumerated the different presentations seen in cases of parturition, and explained the modes of manipulation he usually employed. From the practical manner in which Mr. Lowe described the various presentations, operations, &c., it was evident he had studied the subject to a very great extent.

The most interesting portion of the address was that in which he alluded to placing the animal upon its back, and raising the hind quarters a yard from the floor in cases of breech presentation. This he accomplished by fastening a rope round each hind leg above the hock, and then hoisting, by means of a pulley, the cow or mare, as the case might be, off the ground. In presentations where the calf was found on its back, with the head towards the udder, Mr. Lowe also advocated a similar mode of procedure.

The President, Messrs. W. A. Cartwright, Naylor, Howell, Whittle, J. B. Taylor, Woods, T. Greaves, Hopkin, Dorber, and the Secretary, took part in a very animated discussion, at the close of which Mr. Cartwright proposed, and Mr. Dorber seconded, a vote of thanks to Mr. Lowe for his very interesting address. This was unanimously awarded him.

After the usual vote of thanks to the Chairman, the members separated.

QUARTERLY MEETING, JUNE.

At the quarterly meeting, held June 27th, there were present, Messrs. Whittle, Woods, Lowe, A. Lawson (Manchester), W. A. Cartwright, Mather, J. Lomas, Thomas Greaves, Woolner, W. J. Challinor, A. Challinor, Hopkins, A. Lawson (Bolton), Faulkner, and the Secretary.

The President, being absent during the earlier period of the meeting, Mr. Whittle, ex-President, was voted to the chair.

There being no essay for discussion, Mr. W. A. Cartwright introduced the subject of "Parturient Apoplexy in the Cow," by relating a case the particulars of which were as follows:

During the night of the 15th ult. a cow, six years old, the property of Mr. Hamer, of Whitchurch, calved in the field without assistance. When found on the following morning she was taken home for better attendance. Everything went on well until about nine o'clock on the morning of the 17th, when he was called in to see her. He found her, with the calf, in a small pasture; she appeared anxious about the calf, but she shuffled about with her hind legs, and was weak and tottering.

He (Mr. Cartwright) told the owner that the symptoms were indicative of parturient fever, and that she had better be housed at once. This was done, and she had not been long in the shippon before she exhibited symptoms of uneasiness by lying down and attempting to get up, until she went finally down in a state of unconsciousness.

Treatment.—She had had an aperient on the night of the 15th, and on Mr. Cartwright seeing her he administered another with some Liq. Ammon. Acet., blistered the spine, and had cold wet cloths applied to her head. As she gradually grew worse, and there was little hope of her recovery he advised the owner to have her slaughtered. This was accordingly done, and the carcase was sold to a butcher for £7 10*s.*, who afterwards disposed of it, when dressed, to another butcher for £12 10*s.*

Post-mortem.—When slaughtered she bled well, and the appearance of the flesh was that of a healthy animal. The first stomach was moderately filled with food, so was the second. The third stomach was completely filled with well-masticated grass, a portion of which, between the folds of the stomach, was becoming hard. As a general rule in these cases, Mr. Cartwright had not found much constipation in the third stomach, as asserted by some writers on this disease.

The contents of the small intestines were semi-fluid, and the mucous membrane throughout a great portion of them was much congested, which was the only diseased condition he discovered. The large intestines, liver, uterus, and gall and urinary bladders were all healthy. The brain he could not examine, as it had been much damaged by the butcher, and from the same cause he was prevented making a full examination of the spinal cord, but succeeded in examining a portion from the lumbar region, which, however, did not present any morbid appearance—there being neither inflammation nor effusion.

He examined the urine for albumen by the usual tests, and large deposits were precipitated.

Mr. Cartwright said that for some time he had suspected that the small intestines were frequently diseased in this complaint. He would ask whether the turning of the head to one side was caused by pain in the intestines or by some affection of the brain?

The discussion which ensued was long and animated, both as regards the pathology and treatment of the malady. It was the opinion of all present that stall-fed animals, and those in a very plethoric condition at the time of calving, were most subject to attacks of parturient apoplexy, and that there is, as a rule, a greater risk of "dropping after calving" at the fourth calf than at any other "note."

With plethoric animals Mr. W. J. Challiner adopted a plan

of walking exercise on the road every day for a fortnight previous to calving as a very successful preventive.

Mr. Lowe, in advocating preventive measures, advised turning the cow on a bare pasture twice a day, three hours each time during the fortnight previous to parturition, and when in the shippon allowing her little or no food; but this he only put in practice in the case of a suspicious animal.

From a question put to the members by the Chairman it was elicited, as the opinion of the majority, that the flesh of animal the subject of parturient apoplexy is fit for human food provided the cow be slaughtered not later than about the twenty-fourth hour after "going down."

Before dispersing, the *Secretary* announced to the members that Mr. T. Hopkin had kindly volunteered a paper for the next meeting on "Some of the Diseases of the Horse's Foot."

W. Augustus Taylor,
Hon. Sec.

IMPORTANT DEPUTATION FROM THE ROYAL AGRICULTURAL SOCIETY TO THE VICE-PRESIDENT OF THE COUNCIL.

THE FOOT-AND-MOUTH DISEASE.

The following deputation from the Council of the Royal Agricultural Society of England was received by the Right Hon. W. E. Forster, M.P., Vice-President of the Privy Council, at the Privy Council Office, on Thursday, the 4th July; Sir Watkin W. Wynn, Bart., M.P., President; Earl of Powis; Hon. Wilbraham Egerton, M.P.; Sir T. Dyke Acland, Bart., M.P.; Colonel Kingscote, C.B., M.P.; Mr. J. Dent Dent, M.P.; Mr. T. Statter, Mr. H. S. Thompson, Mr. W. Torr; Mr. W. E. Welby, M.P.; and Mr. H. M. Jenkins, Secretary.

Sir Watkin Wynn having introduced the deputation,

Mr. H. S. Thompson (of Kirby Hall, York) stated that the Council of the Royal Agricultural Society were anxious to bring prominently before the notice of the Government the fact that foot-and-mouth disease in an unusually virulent form is at the present time causing great loss of meat, both by loss of condition in, and death of (particularly in the case of young stock) the animals attacked, and by the fear of the disease inducing farmers to send cattle to market before they have arrived at the proper age and condition. The evil arising from this latter effect of the prevalence of foot-and-mouth disease he regarded as highly im-

portant, because it was impossible to replace the stock thus prematurely sold, and the pastures could therefore not be stocked as they should be in the interests of both the producer and the consumer. In this way both the immediate and the future supply of meat was prejudicially affected, and the question had become so serious that all possible precautions were requisite to prevent the transit of diseased animals. With reference to the precautions needed Mr. Thompson stated that the experience gained in his own county showed that outbreaks of foot-and-mouth disease almost invariably followed the importation of Irish cattle into a district. He attributed this in great measure to the fact that the restrictions at present existing are not thoroughly carried into effect, in consequence of the authorities in many large towns refusing to insist upon their being properly enforced. He thanked Mr. Forster, on behalf of the deputation, for the firmness with which he had withstood the pressure put upon him by deputations of a certain class, the objects of which were more easily analysed after the event than at the moment. For instance, persons interested in the cattle trade at an inland town would get up a strong deputation to protest against the slaughter of cattle at a seaport, on the ground that the inhabitants of the latter would benefit by the reduction of the price of meat there at the expense of a populous inland town.

Mr. Forster asked whether Mr. Thompson referred to home or foreign cattle, because the Privy Council was responsible for the importation of foot-and-mouth disease by the medium of foreign cattle, but they were not in any way responsible for the result of the movement of home-stock.

Mr. Thompson replied that he referred specially to the consequences arising from the importation of cattle from Ireland, and expressed the hope that the Privy Council had the same power over Irish as foreign stock.

Mr. Forster having replied to this in the negative,

Mr. Thompson read the following series of resolutions passed by the special committee appointed by the Council of the Royal Agricultural Society at their meeting on Wednesday:

1. That the foot-and-mouth disease, in an unusually virulent form, is at the present time extensively prevalent and rapidly increasing.

2. That in the case of both cattle and sheep it causes great loss of condition and a certain per-centage of deaths, especially amongst the young stock.

3. That the supplies of meat available for market are in consequence materially diminished and the price proportionately enhanced.

4. That both at the shipping and landing ports in the Irish Channel the precautions requisite to prevent the transit of diseased animals between the two countries are grossly neglected, and in many of the great towns in the interior of the country a great want of vigilance is also observable.

5. That under these circumstances the Royal Agricultural Society feel it their duty to represent strongly to the Government the serious mischief hereby arising, and to urge them to call upon the magistrates and municipal authorities in their respective districts to adopt such restrictive measures as shall seem to them best calculated to abate the evil, and also to insist on the regulations recommended by the Inspectors of the Veterinary Department being promptly and efficiently carried into effect.

(Signed) W. W. Wynn, President.

Mr. Forster having asked whether the first resolution had been arrived at by the Council, in consequence of definite information in their possession

Colonel Kingscote, C.B., M.P., stated that many members of the Council were in a position to prove the fact, each one for his own district. He could himself, for instance, prove that the Bristol market was the great centre of infection in his part of the country (Gloucestershire), and from that market the diseased animals went to Gloucester, Chippenham, Devizes, and other places, and spread the disease through the counties of Gloucester, Somerset, Wilts, Dorset, Hereford, &c. In the dairy districts the disease had lately become exceedingly virulent, and, in one respect, that could not be shown by statistics, namely, in the large number of cows that had cast their calves.

Mr. Forster said that before going further it might be desirable that he should acquaint the deputation with what the Government had actually done; but, first, he would state, entirely apart from the assurance which a Minister felt it his duty to make on such occasions, that he was especially glad to see a deputation on such a subject from the most important and influential agricultural society in the kingdom. The Government were very glad, also, to receive suggestions from so important a body, particularly as foot-and-mouth disease had given them more trouble than anything else. It was one of those maladies that was bad enough to do serious mischief, and yet not bad enough to allow of strong precautionary measures such as the cattle plague would justify. When the Cattle Act was passed, great doubt was expressed as to whether foot-and-mouth disease should be included in its provisions, and even influential representatives of agricultural districts had doubted whether it was right to include it. This Act prohibited the exposure of diseased animals for sale in the

markets, and their conveyance along the highways, but it left most other matters optional with the local authorities, who, however, had the power to issue further regulations. Towards the end of 1869 there was a bad outbreak of foot-and-mouth disease, and the Privy Council issued a permissive order to the local authorities, authorising them to take further measures. Subsequently, the Council received applications from several counties asking the Council to make these measures compulsory. Accordingly they issued the necessary regulations, but found it impossible to work them, and the remedy was considered worse than the disease even by the agricultural public. The nature of the disease also varied, and while it was exceedingly bad in some parts of the country, in others farmers rather preferred that their stock should have it, as mothers preferred their children to get whooping-cough, while they were young. In fact, the Veterinary Department of the Privy Council was not supported in this matter by public opinion, and the continuance of compulsory measures would therefore have endangered the efficacy of their action with regard to pleuro-pneumonia, in which he believed that much good had been done. With regard to optional measures, some counties had insisted upon their being carried out, but others had not, and it had been found exceedingly difficult to obtain statistics showing the result in each case. He wished, however, that the Council of the Royal Agricultural Society would do two things :—1st, That they would inform him specifically, in writing, what regulations they would recommend ; and 2ndly, That they would use their influence with the local authorities to enforce whatever measures were in force. With regard to the foreign import trade, he considered that the agricultural interests had no right to complain against the Government, as if the existence of foot-and-mouth disease were discovered in a cargo of foreign cattle, not only the diseased animals, but the whole cargo were immediately slaughtered. This he considered an exceedingly strong measure, and only justified by the infectious nature of the disease. But it appears that no regulations will keep it out, as it has become an indigenous disease, and the reason why these restrictions are kept in force is that there is no other check upon the foreign trade, while there is over the home trade ; and unless it were made the interest of the producer to send healthy animals, it would distinctly be his interest to send unhealthy ones. This view he had maintained against very strong deputations, but he had yielded so far as to allow the movement inland of healthy beasts from an infected cargo, provided that the railway could be isolated from other stock traffic ; but no town had yet been able to comply with this condition. It was only necessary for two things to be said, viz.,

that meat was very dear, and that the Government regulations pressed heavily upon the importation of stock, to lead people to the inference that the Government made meat dear. With regard to Ireland, he held that it was impossible to treat it except as part of the United Kingdom. At the same time, he must admit that it seemed unfair to those interested in the foreign trade to insist upon their submitting to regulations which were not exacted in the case of Irish cattle. At the present moment the regulations in force in Ireland were the same as those obtaining in England, and as a recent deputation had strongly urged him to expunge foot-and-mouth disease from the Act, he considered that the regulations were now, at least, a reality. The Privy Council had from time to time, also, sent communications to the local authorities urging them to carry out the provisions of the Act. They had also recently undertaken the appointment of the veterinary inspectors, who were formerly appointed by the Customs. The Privy Council are now, therefore, responsible for the inspection of foreign cattle at the ports of landing. As to the home trade, the Government can do no more than (1) call the attention of the local authorities to the subject, and this is very often done; and (2) send an inspector to investigate the circumstances attending a bad outbreak of disease. If, however, the Society would make any positive and precise suggestions, he would undertake that they should receive the most careful consideration. He also suggested that the Society should use its influence with the farmers to use greater care, and on the local authorities to see that the provisions of the Act were complied with.

Sir Watkin Wynn having asked whether the boats plying to and from Ireland are properly examined, and Mr. Statter having stated that, in his opinion, these vessels are the most fruitful centres of infection,

Mr. Forster replied that in consequence of reports that had been received by the veterinary department, he sent an inspector to Bristol, and afterwards issued an Order in Council, of a very strong character if the local authorities would see it carried out, having for its object (1) to diminish cruelty, and (2) to provide for disinfection. Although a strong deputation had protested against the proposal, it was afterwards settled in concurrence with the interested parties. He considered that the Society might usefully exert pressure in this matter also, but that it was impossible for the central government to do more than give power to the local authorities; and public opinion would not sanction the Government taking the power out of their hands.

Mr. Torr (Aylesby Manor, Lincolnshire) mentioned the increased virulence which was characteristic of the present outbreak, and chiefly its greater effect on the feet, so that the animals cannot

bear travelling. He also gave an account of the serious losses which had been incurred by himself and others, particularly in lambs and calves, young and breeding stock suffering more than feeding beasts.

Mr. Forster asked whether the local authorities had made use of the powers which had been given them by the Privy Council.

Mr. Torr was not certain on this point, but as Ireland had been kept clear of cattle plague by the strong restrive measures adopted by the Irish Government, he held that Ireland ought now to be prevented from supplying us with foot-and-mouth disease by our insisting on the examination of stock before they leave Ireland.

Mr. Forster said that this suggestion should be made to the Irish Government, as the Privy Council had no power in the matter, although they had suggested the appointment of an inspector, and other measures which had been adopted by the Irish Government.

Mr. J. Dent Dent, M.P., observed that the evidence laid before the Transit of Animals Committee, of which he had been a member, went to show that the condition of the vessels was the great cause of the propagation of infectious diseases. He presumed, however, that the inspector might inspect these veasels.

Mr. Forster replied that it rested with the local authority to prosecute in case of noncompliance with the regulations, but the central government might put the local authority on their defence in case of their failing to do so.

The Earl of Powis remarked that importations from Ireland were confined to three or four centres, from which infection was spread all over the kingdom. Therefore efficient inspection need not be very difficult to control.

The Hon. W. Egerton, M.P., considered the existing regulations sufficient if properly carried out.

Mr. Thompson, in reply to the suggestion made by Mr. Forster, that the Council of the Royal Agricultural Society should send in writing the particular recommendations that they wished to make, stated that they would probably defer taking that step until after the completion of an investigation which they had organised to take place during the summer and autumn. At present he hoped that the Government would insist upon the existing regulations being complied with.

The deputation then withdrew, after thanking Mr. Forster for his courtesy.

ORDERS OF COUNCIL.

CATTLE FROM SCHLESWIG AND HOLSTEIN.

At the Council Chamber, Whitehall, the 4th day of July, 1872. By the Lords of her Majesty's most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of her Majesty's most Honorable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1869, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:

1. This Order shall take effect from and immediately after the 5th day of July, 1872, and shall cease to have effect from and immediately after the 30th day of November, 1872.

2. This Order may be cited as The Schleswig and Holstein Cattle Order of 1872.

3. This Order extends to Great Britain only.

4. In this Order—The Act of 1869 means The Contagious Diseases (Animals) Act, 1869; a defined part of a port means a part of a port defined by a special Order of the Privy Council in pursuance of Registration 2 of the Fourth Schedule to the Act of 1869: Landing-place for slaughter means a landing-place within a defined part of a port: Master includes any person having the charge or command of a vessel: Other terms have the same meaning as in the Act of 1869.

5. Notwithstanding anything in the Foreign Animals Order of 1871, the regulations in the Fourth Schedule to the Act of 1869 shall not apply to cattle brought from a port in either of the parts of the Empire of Germany respectively known as Schleswig and Holstein.

6. Cattle brought from a port of Schleswig or Holstein shall not be landed elsewhere than at a landing-place for slaughter, unless and until the owner, agent, or charterer of the vessel in which they are brought has received the special permission of the Privy Council to employ the vessel in the importation of such cattle.

7. The landing of cattle brought from a port of Schleswig or Holstein, elsewhere than at a landing-place for slaughter, shall be subject to the following conditions: First, That the vessel in which they are imported has not, within three months before taking them on board, had on board any cattle exported from any port in any part of the Empire of Germany, otherwise than Schleswig or Holstein, or from any port of any of the countries

comprised in the Second Schedule to the Foreign Animals Order of 1871, other than the empire of Germany, or from any port in a country from which importation of cattle into Great Britain is prohibited. Secondly. That the vessel has not, since taking on board the cattle imported, entered any such port as aforesaid. Thirdly. That the cattle imported have not, while on board the vessel, been in contact with any cattle exported from any such port as aforesaid. Fourthly. That the cattle imported are accompanied by a declaration and certificates such as are indicated in the forms set forth in the Schedule to this Order or to the like effect.

8. Farther, cattle brought from a port of Schleswig or Holstein shall not be landed elsewhere than at a landing-place for slaughter, unless and until—(1.) The owner, agent, or charterer of the vessels in which they are imported, or his agent in Great Britain, has entered into a bond to her Majesty the Queen, in a sum not exceeding £1000, with or without a surety or sureties, to the satisfaction of the Commissioners of her Majesty's Customs, conditions for the observance of the foregoing conditions in relation to cattle to be landed under this Order from the vessel; and (2) The master of the vessel has on each occasion of importation of cattle therein satisfied the Commissioners of her Majesty's Customs, or their proper officer, by declaration made or signed or otherwise, that none of the cattle then imported therein have been exported from any port in any part of the Empire of Germany, other than Schleswig and Holstein, or from any port of any of the countries comprised in the Second Schedule to the Foreign Animals Order of 1871, other than the Empire of Germany, or from any port in a country from which importation of cattle into Great Britain is prohibited, and that the foregoing conditions have been observed in relation to all the cattle then imported therein.

9. If the Veterinary Inspector of the Privy Council is of opinion, on the examination of any cattle imported under this Order, that the declaration accompanying the cattle is untrue in any particular, as regards any one of the cattle in the vessel, then all the animals in the vessel shall be detained and dealt with in accordance with the instructions from time to time given by the Privy Council.

10. If the declaration accompanying any cattle imported under this Order is untrue in any particular, as regards any one of the cattle to which it relates, the master of the vessel shall be guilty of an offence against this Order, unless he shows to the satisfaction of the Justices before whom he is charged, that he did not know of the same being so untrue, and that he could not with reasonable diligence have obtained such knowledge.

11. Subject to the provisions of this Order all the provisions of The Foreign Animals Order of 1871 shall continue to apply to cattle brought from a port of Schleswig or Holstein.

ARTHUR HELPS.

CARCASES OF ANIMALS.

AT the Council Chamber, Whitehall, the 11th day of July, 1872, by the Lords of Her Majesty's most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1869, and of every other power enabling them to this behalf, do order, and it is hereby ordered, as follows:—

1. This Order shall take effect from and immediately after the thirty-first day of July, one thousand eight hundred and seventy-two.

2. This Order may be cited as The Carcases of Animals Order of 1872.

3. In this Order—

The Act of 1869 means The Contagious Diseases (Animals) Act, 1869:

Master includes any person having the charge or command of a vessel:

Other terms have the same meaning as in the Act of 1869.

4. In addition to the powers and duties vested in and imposed on Local Authorities by section sixty of the Act of 1869, and by Articles 36 and 37 of the Animals Order of 1871, every Local authority is hereby empowered to make, from time to time, with the view of preventing the spreading of contagious or infectious diseases among animals, regulations for the following purpose:—

For securing the burial, in accordance with the directions of Article 36 of The Animals Order of 1871, of the carcases, being within the district of the Local Authority of animals (including horses) which have died of any contagious or infectious disease, or the destruction thereof, under inspection of the Local Authority, in the mode prescribed by Article 37 of The Animals Order of 1871.

5. If an animal (including a horse) on board a vessel in Great Britain, or within three miles of the shore thereof, dies of or is slaughtered in consequence of being infected with a contagious or infectious disease, the master of the vessel shall, with all prac-

ticable speed, cause the carcase thereof to be disinfected on board the vessel in such mode as the Privy Council from time to time direct or approve.

If he fails to do so, he shall be deemed guilty of an offence against this Order.

6. If any person throws or places, or causes or suffers to be thrown or placed, into or in any river, stream, canal, or other water in Great Britain, or into or in the sea within three miles of the shore of Great Britain, the carcase of an animal (including a horse) which has died of or been slaughtered in consequence of being affected with a contagious or infectious disease, he shall be deemed guilty of an offence against this Order, unless he shows to the satisfaction of the Justices before whom he is charged that he did not know that the same had so died or been slaughtered, and that he could not with reasonable diligence have obtained that knowledge.

7. It shall not be lawful for any person, except with the licence of the Privy Council, to dig up, or cause to be dug up, the carcase or any part of the carcase of any such animal (including a horse) buried under a regulation of a Local Authority or under the direction of a Receiver of Wreck.

If any person acts in contravention of this Article he shall be deemed guilty of an offence against this Order.

(Signed) ARTHUR HELPS.

IMPORTATION OF ANIMALS FROM BELGIUM.

AT the Council Chamber, Whitehall, the 15th day of July, 1872. By the Lords of Her Majesty's Most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1869 (in this Order referred to as the Act of 1869), and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:—

1. This Order shall take effect from and immediately after the eighteenth day of July, one thousand eight hundred and seventy-two; and words in this Order have the same meaning as in the Act of 1869.

2. The Order bearing date the eighth day of December, one thousand eight hundred and seventy-one, prohibiting the landing in Great Britain of cattle, manure, and hay, and regulating the landing in Great Britain of sheep, goats, and certain articles brought from any place in Belgium or France, is hereby revoked

so far as such Order relates to cattle, sheep, and goats brought from any place in Belgium.

3. The Second Schedule to The Foreign Animals Order of 1871 shall be read and have effect the same as if Belgium was included in the list of countries therein named.

4. Nothing in this Order shall invalidate or make unlawful anything done under said Order of the 8th day of December, one thousand eight hundred and seventy-one, before this Order takes effect, or interfere with the institution or prosecution of any proceeding in respect of any offence committed against, or any penalty incurred under, the Act of 1869, or the said Order of the eighth day of December, one thousand eight hundred and seventy-one.

(Signed) ARTHUR HELPS.

PREVENTION OF CATTLE IMPORTATION FROM RUSSIA.

AT the Council Chamber, Whitehall, the 19th day of July, 1872. By the Lords of Her Majesty's Most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the power in them vested under The Contagious Diseases (Animals) Act, 1869 (in this Order referred to as the Act of 1869), and of every other power, enabling them in this behalf, do order, and it is hereby ordered, as follows:—

1. This Order shall take effect from and immediately after the nineteenth day of July, one thousand eight hundred and seventy-two; and words in this Order have the same meaning as in the Act of 1869.

2. Cattle brought from any place in the dominions of the Emperor of Russia shall not be landed at any port or place in Great Britain.

3. The following articles brought from any place in the dominions of the Emperor of Russia shall not be landed at any port or place in Great Britain:—

Manure; or hay.

4. The following articles brought from any place in the dominions of the Emperor of Russia shall not be landed at any port or place in Great Britain, except at the ports at which foreign animals may be landed, and shall not be removed from the place where landed without a certificate of an Inspector of the Privy Council, certifying that such articles are not likely to introduce any contagious or infectious disease;—

Meat; hides; fat; hoofs; or horns.

5. Subject to the provisions contained in the Orders of Council relating to the ports of Granton and Leith, dated the tenth day of August, one thousand eight hundred and sixty-nine, and in the Order of Council relating to the port of Southampton, dated the first day of October, one thousand eight hundred and seventy, all the regulations in the Fourth Schedule to the Act of 1869 shall apply to sheep and goats brought to Great Britain from any place in the dominions of the Emperor of Russia, and landed in Great Britain, and all such sheep and goats shall be slaughtered within ten days after the landing thereof, exclusive of the day of landing: Provided nevertheless, that cattle, sheep, or goats being or having been on board any vessel at the same time with any cattle brought from any place in the dominions of the Emperor of Russia, shall not be landed at any port or place in Great Britain.

6. Notwithstanding any Order of Council to the contrary no sheep or goats brought from any place in the dominions of the Emperor of Russia, and landed within the port of London, shall be moved alive out of any part of the port defined as a part within which foreign cattle may be landed for slaughter.

(Signed) ARTHUR HELPS.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF COMMONS, *Friday, July 5th.*

IMPORTATION OF CATTLE FROM SCHLESWIG-HOLSTEIN.

Mr. Samuda asked the Vice-President of the Privy Council whether the Government had been able to make arrangements with the German Government by which cattle from Schleswig-Holstein could be imported without the necessity of being slaughtered at the port of landing, and, therefore, as regarded London, with a free permission to pass alive to the Metropolitan Cattle Market at Islington.

Mr. W. E. Forster said that an order would appear in the *Gazette* that day with regard to the importation of cattle from Schleswig-Holstein, and as it affected a most important interest, perhaps the House would allow him to explain its meaning. It had been found necessary to maintain the restriction requiring cattle from Schleswig-Holstein to be slaughtered at the port of landing in consequence of the proximity of Germany to Russia and other countries in which the cattle plague permanently existed. They had always been sorry that this restriction should apply to cattle from Schleswig-Holstein, where large numbers of

cattle were bred, and which was proved by experience to be as free, if not more free from disease than cattle in most countries. But he was glad to say that the German Government, which had shown much interest in the matter, had come to an arrangement with his noble friend the Foreign Secretary, whereby on the production of a Government certificate that the cattle had been bred in Schleswig-Holstein they would be allowed to enter the inland towns and the cattle market at Islington in the same way as cattle from Denmark and Holland, provided that those provinces were fulfilled which, after careful deliberation, the Privy Council considered to be sufficient for the protection of cattle from disease.

FOOT-AND-MOUTH DISEASE.

MONDAY, *July* 15*th*.

In reply to *Mr. Backhouse*,

Mr. Forster had reason to believe that there had recently been a considerable increase in the spread of the foot-and-mouth disease amongst cattle. He had no statistics, however, on the subject, as the local authorities declined to send in returns, which were only provided for by a permissive Order in Council. It rested with those authorities, if they chose, to take precautions against the spread of the disease.

THURSDAY, *July* 18*th*.

Mr. Read asked the Vice-President of the Council whether his attention had been directed to the prevalenco of foot-and-mouth disease in the Metropolitan Cattle Market, where over 100 cattle so diseased were certified by competent veterinary surgeons to have been exposed for sale upon four successive Mondays, and also to a case at Norwich, in which a Norfolk dealer was fined £50, and £8 4*s*. costs, for exposing twenty-five sheep affected with foot-and-mouth disease on Norwich Hill; and whether he would reconsider the expediency of maintaining the present regulations under which the district authority rigorously enforces the penalties under the Contagious Diseases (Animals) Act while the foot-and-mouth disease, as well as sheep scab, existed in the metropolitan market, and was from thence taken to all parts of the kingdom.

Mr. Forster said the department had received a letter stating that it was the impression of several veterinary surgeons that foot-and-mouth disease had prevailed in the Metropolitan Cattle Market. On inquiry, the local authority of the metropolitan

market, which was the Board of Works, stated, through their inspector, that they could not ascertain that the statement was correct. He was inclined to believe they were right in their opinion. With regard to the Norwich case he was glad to find the authorities there were determined to put the Act in force. It was not the duty of the department but of the local authority to put the Act in force. In the metropolis they were endeavouring to do it to the utmost of their power, and since the 1st of January 359 cattle had been seized and slaughtered. The hon. gentleman asked him to reconsider the expediency of maintaining the present regulations under which the district authority rigorously enforces the penalties under the Contagious Diseases (Animals) Act, while the foot-and-mouth disease, as well as sheep scab, existed in the metropolitan market, and was from thence taken to all parts of the kingdom. The regulations in the Act he was bound to enforce, and he believed there was a very general desire in all parts of England to enforce them and to stamp out the disease, whenever it was found out. But any attempt to do so by renewing the cordon would, he believed, meet with strong opposition. He trusted the local authorities would put the Act in force to stop the exposure of animals having the foot-and-mouth disease, to prevent the movement of such animals, and especially to disinfect the markets where they had been.

Mr. Read, in consequence of the unsatisfactory answer he had received, begged to give notice that early next Session he would move for the appointment of a Select Committee to inquire into the operation of the Contagious Diseases (Animals) Act, and the constitution of the Veterinary Department of the Privy Council. (Hear, hear.)

Mr. Bernal Osborne appealed to the Speaker whether the right hon. gentleman had not introduced new matter in his reply.

The Speaker said he had not discovered that the right hon. gentleman was at all out of order in the reply he had given to the question. (Hear, hear.)

Mr. Osborne.—It was so enormously long. (A laugh.)

THE CATTLE PLAGUE.

FRIDAY, *July* 19*th.*

Sir H. Selwin-Ibbetson said there was a report that there had been a case of cattle plague at Deptford, and wished to know from the Vice-President of the Council whether the report was correct. He should also like to hear from the right hon. gentleman whether any steps were being taken to prevent the introduction of the disease from foreign ports.

Mr. W. E. Forster replied that that morning one animal out of a cargo of twenty-five head of cattle which had arrived at Deptford from Cronstadt had, he believed, died of cattle plague. Having arrived there, they would be slaughtered, and no communication would be allowed with other parts of the country. The representative of the Veterinary Department had gone down to Deptford to see that that part of the market in which the animal died should be kept isolated, not only from animals, but from persons; and the only fear he had was the danger of the infection being taken by any human being who might have happened to go near the animal. As to the animals themselves, every precaution would be taken to prevent the spread of the disease by destroying them, and disinfecting everything on board the vessel in which they came.

Sir H. Selwin-Ibbetson wished to know whether steps would be taken to prevent any further introduction of cattle from Russia.

Mr. W. E. Forster replied that the importation from Russia was very small, and the order would that day be issued preventing it.

Sir J. Elphinstone asked how the right hon. gentleman meant to deal with the ship which brought over the infected animal, for if it went to any other port it might spread the disease there.

Mr. W. E. Forster replied that his power was limited by the Act of Parliament. The power he possessed was to take care that the ship was thoroughly disinfected, but he was not aware that the department had power definitely to stop ships.

Veterinary Jurisprudence.

COUNTY COURT, MELBOURNE.

April 27th.

(Before his Honour Judge POHLMAN and a Jury of four.)

ALLEGED VETERINARY MALPRACTICE.

SERRELL *v.* MITCHELL.

THIS was an action brought by Mr. Thomas Serrell, surgeon, of Fitzroy, to recover £49 from Mr. Graham Mitchell, veterinary surgeon, for alleged malpractice in the treatment of a horse

which plaintiff had sent to Mr. Whiteman, M.L.A., to be cured of a wound in the leg.

Mr. G. P. Smith for plaintiff; Mr. W. V. Smith for defendant.

Thomas Serrell, the plaintiff, a medical practitioner, of Fitzroy, said that in the end of January last he had a valuable horse turned out in a paddock at Whittlesea. On the 13th February the horse, which was a gelding, was brought to town and taken to Mr. Whiteman's veterinary infirmary, in M'Killop Street, for treatment. On the 16th February he received a letter from Mr. Mitchell, stating that the horse had previously received a fracture of the radius without displacement, and on that morning, while the horse was being dressed, displacement occurred. He did not agree with what Mr. Mitchell stated, and sent Mr. Miscamble, veterinary surgeon, to examine the case. In two or three days after the horse was dead he met Mr. Mitchell, who said he was sorry for the loss of the horse. Witness told him that he ought not to have thrown the horse, to which he made no reply. He also told Mr. Mitchell that he had sent his man for the bones of the horse, and they were refused to the man, to which Mr. Mitchell replied that they were his property, and he would not give them up, as they might be required in a court of law. He (witness) considered it was not proper treatment to throw the horse down, and in this case Mr. Mitchell sent him word that the bone was not broken, but he thought matter had accumulated in the leg. Could not say whether applying a seton would be proper treatment if there had been accumulated matter in the leg. Thought the defendant ought to have known before he threw the horse whether the bone was broken or not. The bone which was broken was the radius or leg bone below the shoulder. (The broken bone of the dead horse, and also a broken one of a healthy horse, were produced and shown to the witness.) There was a slight difference in the fractures of the bones produced. He admitted there might have been a partial fracture of the bone of his horse before it went into the defendant's hands, but by throwing the fracture became a complete one. Did not hold that there could not be spontaneous fracture of the bone, as he had heard of such fractures. The horse was only brought to town because there was a swelling on the leg. No horse could have walked the distance from Whittlesea with a complete fracture of the leg. The horse had been attended to at Whittlesea by his son and his son's manager, who fomented the wound. A sound bone of a horse might become as diseased as was the bone shown out of his horse in ten days, but it would not become so diseased in a month in a human creature. He valued the horse at £30. Gave £18 for it when he bought it.

Edward Serrell, a young man, son of the previous witness, deposed that the horse in question was several months in the paddock at Whittlesea. It was thoroughly sound when put there, but about the 20th January it appeared to have had a kick in the leg, for which he treated it. When he brought the horse into town—viz., the 13th February—he rode it behind a flock of about 200 sheep during the greater part of the journey, but cantered it in for the last seven or eight miles. Took the horse to Mr. Whiteman's veterinary infirmary, and there saw Mr. Mitchell, who examined it with his hands, especially about the swollen part of the leg, and said he thought the wound had been caused by a stake. Believed Mr. Mitchell said the bone was not broken. Mr. Mitchell told him they would probably have to throw the horse and examine it, and very likely have to put a seton into it. The horse was not at all lame when he took it to Whiteman's, but it appeared lame once when it was in the paddock.

John Roycroft, station manager to the last witness, gave evidence to the effect that when he found out that the horse was lame, it had not been so more than a day or two. The lameness appeared to have been caused by a kick or a stake.

John Miscamble, veterinary surgeon, stated that if the horse had been let alone while it was alive, the broken bone would have healed of itself, and nature would have removed the diseased bone which had formed in the leg. There was no doubt the leg was broken before the horse came from Whittlesea, but the parts had united to a certain extent, and were broken again by the casting of the horse. If it had remained in the paddock it would have got well. Had the horse been brought to him he would have detected the injury to the bone if he had been told that it had been staked or kicked. It seemed to him that there was no necessity for putting a seton into the horse, but doctors differed. A horse might walk some distance with a complete fracture of the leg if the ground were good. It was very improper treatment to throw a horse to do anything to a leg like Mr. Serrell's horse's leg was. A horse to be cast ought to have four good sound legs. In cross-examination, he said he believed the horse went to Whiteman's, not with a completely broken leg, but with a broken leg partly repaired. The bone of a horse would get as diseased as that produced was in about a fortnight. There was evidence of sequestrum, or filling up with diseased bone of the inside of the leg bone, where the marrow was; but nature would have repaired all that, and was doing it in this case. Supposing inflammation occurred from the blow which the horse had received, the sequestrum would have formed as it appeared in about ten days. The horse would, if let alone, have recovered, and absorbed the sequestrum. The whole appearance of the bone showed that it

was on the way to recovery. The horse was nearly well at the time of its death. He could have found out that the bone was injured, and he would not have used a probe to do so, but would have ascertained it by stirring the leg about. Did not think there was such a thing as spontaneous fracture, for there was always a cause for an effect. It was a wonder that the young man did not cause a second fracture of the bone by cantering the horse into town. The leg was 19-20ths all right when it was treated by the defendant. He saw the horse before it was killed, and discovered that the bone was broken then. Did not discover sequestrum then. That was after the complete fracture was sustained. Probing was the only mode by which sequestrum could be ascertained while a horse was alive. He had to pay damages once himself for his treatment of a horse.

John P. Vincent, veterinary surgeon, agreed generally with the evidence of Mr. Miscamble. After the first fracture, any violent action would have been sufficient to fracture the bone again. At the *post-mortem* it was seen that the periosteum was thickened, showing a long continued and chronic inflammation. There were the remains of an old abscess in the leg. If he had wanted to probe the horse's leg he should have asked permission of the owner to do so. *He treated Stockowner for a broken leg, and when the raffle of Mr. Fisher's horses occurred, it was very necessary he should carry the horse alive over that day, because if he did so he would save the owner* 500 *sovereigns. He did carry it over that day, but did not cure it, that being impossible.*

Mr. W. V. Smith (the plaintiff's case being concluded) submitted that the plaintiff must be nonsuited on two grounds. First, that Mr. Mitchell was only Mr. Whiteman's servant, and was, therefore, not responsible; and, secondly, that there was no evidence whatever that Mr. Mitchell ever threw the horse at all.

Mr. G. P. Smith contended that there was presumptive evidence of the horse having been thrown, Mr. Mitchell having stated that he would probably have to throw it, and having made no reply to Mr. Serrell when he told him he ought not to have thrown the horse.

His Honour said he would reserve the points.

Mr. W. V. Smith then addressed the jury, arguing that it was impossible for the defendant to have discovered what was wrong with the horse without probing it, and that probing was such a painful operation that no horse would bear it unless it were thrown and safely secured beforehand. He attributed the evidence which the veterinary surgeons had given against the defendant to ill-feeling, because he was in opposition practice to them, and called

William Thomson, F.R.C.S.E., to give evidence respecting the diseased bone. The witness said the bone was considerably diseased. A bone like that would be much more likely to fracture than a healthy one would; sudden tripping over one of the Melbourne gutters would have been sufficient to fracture it; it would be liable to snap from sudden muscular contraction. The fracture of a healthy bone would have been more diagonal and splintered than the fracture in that bone was, it being nearly straight across the leg, and not lengthwise. In the original injury to the horse, some of the shell of the bone had been driven to the inside of the bone, which caused accumulation of matter, kept up constant irritation, and rendered the cure of the leg impossible, unless the parts driven in were removed. As long as the foreign body remained driven in the bone, and caused accumulation of matter, it was impossible to effect a cure.

Mr. Graham Mitchell, veterinary surgeon, said he had charge of the veterinary business at Whiteman's infirmary, as personal *employé* of Mr. Whiteman. On the 13th February, Mr. Serrell, jun., took the horse to the infirmary, and witness examined it. He found a swelling, extending nearly from the elbow to the knee of the near foreleg. A little below the elbow, on the outer part of the leg, there was a scar healed up. Examined the leg to find foreign matter, abscess, or disease of the bone. Young Serrell said it was his opinion that the injury was done by a stake. Witness told him there was deep-seated irritation, caused by a foreign body or abscess or disease of the bone, and he would probably require to throw the horse to find out what was the matter. Mr. Serrell said, "All right; I will leave the horse in your hands." There was a diffused swelling, and he was inclined to think that the horse had been staked. He thought the best plan would be to see if there was retention of matter, which he had failed to find near the surface; and he inserted a seton for that purpose. To do so he secured the horse by a twitch, and he had very great difficulty in performing the operation. On the 14th February he had the leg continuously fomented with warm water and the seton dressed. On the 15th February there was considerable discharge of pus from the upper portion of the seton. The enlargement of the leg had increased, and the horse appeared to be much lamer than it was on the 13th. On the morning of the 16th he found the horse much worse, and bending the near fore leg. It winced on the slightest touch. Being convinced that there was deep-seated irritation, he got four of Mr. Whiteman's men to hold the twitch, and tried to probe the animal in the course of the seton, to see if there were any signs of connection with an abscess, but whenever he attempted to

probe, the animal reared and plunged so much that it was impossible to probe it in that way. He therefore got the hobbles, and they threw the horse. When it was on the ground, and while he was probing it, he distinctly heard a cracking of the bones (crepitus). He then considered further treatment useless, and the horse was afterwards destroyed. Miscamble came before the horse was killed, and examined it. He asked witness if he thought there was a fracture of the bone, to which he replied in the affirmative. Miscamble declined to give an opinion, though asked by witness to do so. A *post-mortem* was made, and on removing the skin of the leg extensive effusion was found. Immediately over the periosteum (which was thickened, inflamed, and easily stripped from the bone), there was an abscess containing several small pieces of bone. After cutting away the bone they found there had been a partial fracture of the leg, arising from injury. There was a deposit of bone inside the leg bone, which, in his opinion, had been going on for five or six weeks. He also found that this deposit extended into the elbow-joint, and would, in a month or two, have caused stiffness of the joint. Without the removal of the pieces of bone there would have been no chance whatever of the wound being cured, and without cutting down to the bone no person could possibly have seen that there was any disease of the bone. It was thoroughly impossible that so much sequestrum in a bone could have been removed by natural causes. It was necessary to cast the horse before it could be probed. He managed the veterinary business of Mr. Whiteman, and got half the profits, after expenses were paid, for doing so.

Charles Forbes, veterinary surgeon, said he agreed altogether with the treatment which Mr. Mitchell had adopted. It was quite proper to throw the horse.

James Michael Rowell, veterinary surgeon, did not disagree with the treatment adopted by Mr. Mitchell. It was quite right to throw the horse, and a man would probably both injure himself and the animal he was operating on if he tried to probe without it. The horse in question could never have recovered in any case from such a diseased bone as it had; at least not so as to have been of any use, because it would have had a stiff joint, and been useless.

John Whiteman, M.L.A., said it would have been impossible for the horse to have recovered by natural causes, so as to be of any use with such a diseased bone.

His Honour then summed up the evidence to the jury, and said the principal thing for them to consider appeared to be whether a rough system like throwing was the proper plan to have adopted in the case.

The jury, after a retirement of about half an hour, agreed to a three-fourths verdict for plaintiff, and assessed the damages at £5.—*Argus*.

APPOINTMENTS UNDER THE CONTAGIOUS DISEASES (ANIMALS) ACT.

Mr. A. C. Cope, M.R.C.V.S., and Mr. D. Dudgeon, M.R.C.V.S., have been appointed Inspectors, under the above-named Act, by the Lords of the Privy Council.

ARMY APPOINTMENTS.

War Office; *July 23rd.*

Veterinary Department.—The following Acting Veterinary Surgeons to be Veterinary Surgeons—George Digby Whitfield, Charles Clayton, Charles Witney Gillard, Henry Thomson.

To be Acting Veterinary-Surgeons—William Alfred Crow, *vice* W. F. Blanshard, promoted; James Joseph Philips, *vice* Whitfield; Iles Matthews, *vice* Clayton; John Herbert Cox, *vice* Gillard; George Joseph Robert Rayment, *vice* Thomson.

OBITUARY.

We regret to record the death of Mr. Charles Messent Baker, M.R.C.V.S., late of Clapham. His diploma bears date May 22nd, 1850.

ERRATUM IN NO. 535.

For "an obscene cause," *read* "an obscure cause," p. 475, line 19.

OF AGRICULTURE

THE

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Communications and Cases.

THE APPOINTMENT OF MEDICAL EXAMINERS TO VETERINARY EXAMINING BOARDS.

By George Fleming, M.R.C.V.S., Royal Engineers.

In the *Veterinarian* for August there is a leading article on the "Appointment of Medical Examiners," and also a very meagre and imperfect report of the discussion which took place on this subject at the last Quarterly Meeting of the Royal College of Veterinary Surgeons.

With respect to the report I have nothing to say, except to remark that it does not fairly represent what was expressed; or rather, it fails to give all the principal points of what was said at the meeting as to the appointment of medical men to officiate at veterinary examining boards. This is to be regretted; indeed, this regret is of long standing. A reporter is paid at a high rate out of the funds of the Royal College, and yet the profession gleans only the most imperfect and fragmentary knowledge of what is said or done at these meetings. Any ordinary penman, any secretary, should be able to furnish more and put it in a better form. As it is, but little information is conveyed, and that not always correct, as to what transpires at the Council Board; and outsiders must often wonder what really has been accomplished, and whether the speakers were in their senses, understood the meaning of their words, or knew what was being discussed. It has been frequently insisted upon that these reports should be published at greater length, and from the shorthand reporter's notes. Undoubtedly, the profession has every right to know what takes place at these meetings, how the discus-

sions are conducted, and what each speaker has to say on the different subjects brought before the Council. No member should think himself privileged to say at these meetings what he would not choose to say to the profession at large; only at a secret committee of the Council should secrecy be observed.

As matters are at present conducted with regard to these reports, members of Council are frequently placed in a false or ludicrous position, and the profession can have but the faintest idea of the business transacted or the opinions expressed at their parliament; hence councilmen and non-councilmen are placed in an unsatisfactory, sometimes in even an antagonistic attitude towards each other. I certainly have found myself in this position more than once, and it appears am in it again.

As one who joined in the discussion in favour of some consideration being shown to the claims of the profession to provide examiners from its own ranks, what I am reported to have said is but a portion of what I did say, the most important part being omitted in the report. I observe that the same has occurred with the remarks of other speakers.

The discussion certainly was not very animated; but few spoke, and those who did were pretty evenly divided. No motion or division took place, for the simple reason that a bye-law stood in the way; though I daresay the majority would have been against the election of any more medical men unconnected with the veterinary profession, had the matter proceeded so far.

What I have now to complain of, however, is the position I am placed in with regard to what I said at the meeting, and what has been said for me in the "leading article" just alluded to. As a co-editor of the *Veterinarian*, I have been informed that, in addition to the share I have in the literary work of the journal, I must also share the responsibility of the opinions expressed by the other editors (the *share-holding*, unfortunately, does not go beyond this). In the present instance it causes me much pain to decline this responsibility; inasmuch as I am ever anxious that harmony should reign in our ranks, and I always differ from my colleagues with regret. But I cannot acquiesce in sentiments which do the profession an injustice, nor coincide in opinions which, in addition to their being entirely opposed to those I hold, would seem to reflect discredit on its members. What I said at the Council meeting, and what is written in the "leader" referred to, are utterly incompatible. Having expressed myself in all sincerity, and with a full conviction of the respon-

sibility under which I spoke when I drew attention to the wrong we were doing our science in this country, by appointing medical men to offices which veterinarians have every right to hold, I have no other course open to me than to assure the profession that I wholly and entirely decline sharing in the opinions and sentiments set forth in the "leader."

I honestly believe, because I have ample proof, that the knowledge of anatomy possessed by the non-teaching members of the profession is more than "mere knackerman's anatomy," and that their acquaintance with physiology is somewhat above "mere blacksmith's physiology." If the writer of the article in question bases the statement he wishes to make indirectly on indubitable facts, then, perhaps, he has furnished us with the severest possible condemnation of not only the system of teaching anatomy and physiology which has been carried on at the veterinary schools for the last eighty years, but he has doomed the medical examinership also to immediate suppression. He solemnly sets his face against veterinary surgeons being competent to examine in veterinary anatomy and physiology, which we are supposed to have studied and been satisfactorily tested in, and which is advertised as taught at the schools; and then he emits the profound truism that "a man to be an examiner must possess something beyond mere knackerman's anatomy and blacksmith's physiology." Since veterinary science was first introduced to British soil, did it ever receive such a stab in the back? How can we hold up our heads in public, call ourselves a body of scientific men, point to the names of the medical men who "are distinguished either as anatomists, physiologists, histologists, or chemists," which figure on our diplomas, when our professional journal lends its influence to degrade our knowledge to that of the knackerman and blacksmith?

Heaven be thanked! the insinuation is as unfounded as it is unworthy of any member of our body to entertain for a moment. There are gentlemen in the veterinary profession, albeit they are not professors, who are as competent to examine in these subjects as there are teachers to teach them; who are regarded, trusted, and treated as scientific men; and who are labouring quite as devotedly and energetically to raise the status of their calling as the schools. I have nothing to say in defence of the present body of veterinary examiners. If they are not efficient, as the article states, they are perfectly able to ask in what their incapacity consists.

I only maintain that it is a wrong to the profession that,

in such subjects as anatomy and physiology, medical men should be appointed as examiners. I might even go further, and designate it as a burlesque to appoint human surgeons and anatomists to examine students on the anatomy and physiology of the domesticated animals: subjects which these men have not studied, and the practical importance of which, with regard to their bearings in veterinary science, they cannot appreciate. Who would ever think of asking the opinion of one of these examiners in an obscure case of lameness, a case of disordered digestion in the cow, or the other numberless cases in which a knowledge of veterinary anatomy and physiology is all important?

Is not the daily round of the veterinary surgeon's experience largely mixed up with his knowledge of these sciences? Does not his success in practice mainly depend upon his keeping up the elementary notions of them he acquired at College; adding to them, and perfecting them by the experience he acquires day by day? To my mind—and I daresay I shall be borne out in this by those who have observed like myself—a good veterinary practitioner is a better anatomist and physiologist than the mere lecturer or the veterinary surgeon who has just obtained his diploma, simply because he can apply his knowledge of these subjects in a practical manner, and has learned to know how much of them are useful to him and beneficial to his clients. It would appear that some of those who are anxious that medical men should be maintained as examiners altogether omit the fact that, however accomplished these men may be as anatomists and physiologists, unless they have carefully studied the lower animals, their learning in their own special department avails them very little; and at the meeting one of the speakers who spoke strongest in favour of the old-fashioned system being continued, was obliged to confess "that the anatomists they had had knew very little beyond the anatomy of the human subject." Those who have some acquaintance with the anatomy and physiology of man, and are still more familiar with the structure and functions of the lower animals, will assent to the assertion that they are as widely different as is human pathology from comparative or animal pathology; and that, as a rule, medical men know as little of the one as they know much of the other. Therefore it is something more serious than a farce to appoint them as examiners—it is lending ourselves to what some plain-speaking people would unhesitatingly designate as an imposition—merely for the sake of having their names on the graduate's diploma: for that really was the

only argument that could be brought forward in support of the election of human anatomists and physiologists.

The profession will be better able, perhaps, than I am to estimate the weight of this argument; assuredly the public who employ veterinary surgeons will not. It is ability, not a diploma, that is required in practice; and clients not once in a lifetime ask to look at the names of those who testified to the fitness of the newly-fledged practitioner. It is perhaps lucky they do not; for if they only knew that the veterinary surgeon's knowledge of anatomy and physiology was tested by Professor A——, a most distinguished teacher of these subjects in one of the medical schools, whose horse stood for some days with a dislocated patella which the talented gentleman mistook for a broken leg; or Professor B——, who blistered his horse's hip for a lameness due to a wound in shoeing one of its fore-feet; or some other *trifling mistake* of these distinguished men, I fear they would have little confidence in the skill of the veterinary surgeon.

For myself, I would rather have the names of distinguished veterinarians on my diploma than the names of the medical gentleman inscribed thereon, celebrated as they are in their own immediate calling.

In the early years of the profession in this country, medical men nobly came forward to assist it in its endeavours to get beyond the period of infancy, and their efforts must ever call forth the gratitude of veterinarians; but those times have long gone by: eighty years have elapsed since the advent of animal medicine in Britain, and in that time some progress has been made; the equipment of the infant should long ago have been discarded, and the independence of manhood assumed. The predictions of those who believe in the eternal fitness of things as they are, are destined to be unfulfilled; for the propriety of these elections will not bear a moment's investigation. It is not a question of Scotland for the Scots, nor Ireland for the Irish, but of the veterinary profession doing justice to itself and the public. This is no narrow or selfish policy, but a policy of honesty and progress, which will remove us further from the days of "knackerman's anatomy and blacksmith's physiology."

One of the proposals persistently made by the late Professor Spooner: perhaps the only one he ever prominently made in the interests of the profession—for the most rigid stickler for the upholding of things as they are could never accuse him of being an advocate for change—was the dismissal of medical men from our examining boards, and the substitution of veterinary surgeons. And every member of

the profession who has seriously studied the matter, and has the real interest of his science at heart, will confess he was justified in doing so.

Asking medical men who know nothing of our profession to examine our students degrades and disgraces us, as it is a confession that we are unable to do so ourselves. Hence, when a Cattle Plague Commission is about to be appointed, medical men will represent the fact that they know more of veterinary matters than veterinary surgeons, as they have to examine graduates in veterinary science; consequently, medical men will form the bulk, if not entirely compose the commission—perhaps a veterinary surgeon who is not a cattle pathologist will be put in to give the thing a semblance of business. Or if an International Veterinary Congress is about to be held, on the recommendation of some one who entertains the very smallest amount of esteem for veterinary authorities, and the profoundest regard for medical men, a doctor will be sent to represent us.

All this is damaging to our reputation; and we need never speak of our efforts to raise the status of the profession so long as we tolerate it. In no country but England are medical men who know nothing of veterinary science permitted to act as its representatives or examine its graduates; and no other profession dares to act as we do.

If we are to be consistent, and if distinguished human anatomists, physiologists, or histologists, are competent to test our graduates in anatomy and physiology, why not have distinguished human pathologists to examine them as to their knowledge of the maladies of the horse, ox, sheep, and pig? They are as competent to do one as the other.

But we have got beyond that stage in pathology; and he would be a bold man who would advise us to recur to it.

It has been insinuated, as already remarked, that the body of veterinary practitioners know next to nothing of anatomy and physiology; this is a serious charge if it is correct. But it is not. Fortunately, perhaps, for the credit of the practitioners, the system of selecting teachers for the schools does not deprive them of their ablest colleagues; and there is reason to believe that there would be no difficulty in filling as many anatomical and physiological chairs as are likely to be vacant or instituted in this country, by men who are not a whit inferior to those who so ably act as teachers at present.

Anatomy has always been ranked in a third-rate position in the schools, and has not yet been held in much honour. Its inculcation is left to the newly-inducted teacher; and we have seen that teachers ready for immediate work can be

found in any number in the ranks of the profession. I have had no experience of teaching students, but should fancy it more difficult to teach than to examine. I daresay some of the senior teachers will corroborate this; at any rate, a teacher is always supposed to be a highly accomplished and scientific member of the profession; though it would appear some think the opposite of the examiners and the profession as a whole.

If, then, highly accomplished and scientific teachers can be found so easily, and in such numbers, why cannot two or three examiners be selected from the whole mass of the profession to examine students on a subject of third-rate importance, and which may have been taught by one gentleman who only a few months before was only possessed of a "knackerman's anatomy and a blacksmith's physiology?" This question the members of the profession will, no doubt, be called upon to decide at some time or other.

It must never be forgotten that our reputation is in our own hands, and not in those of the medical profession. If we indulge in deprecatory remarks and unworthy insinuations against ourselves, we are not raising the status of our profession, but lowering it. There are in it teachers, examiners, and practitioners. All should work for the accomplishment of the same object—the welfare of our science; this will never be attained unless we are brought to hold each other in more esteem, and care less for patronising medical men, who are aliens, than valuing the ability that is to be found in our own ranks. The antiquated notion that our examining boards must contain medical men, merely because they are distinguished in their own special department of science, will in due course be consigned to the usual repository for all old-world silly notions.

The assertion that men cannot be found in the ranks of the profession able to examine students in the rudiments of anatomy and physiology, is belied by the fact that veterinary surgeons are at present examiners on these subjects; and it will be in the knowledge of every one who has had any considerable experience of the profession that all the talent and ability is not wholly concentrated in the teaching schools; there being at least quite as many competent examiners as there are distinguished teachers.

If a "knackerman's anatomy and a blacksmith's physiology" be prevalent among us, let us look to the schools and the system of medical examinership for the cause. One portion of the remedy, at least, is in our own hands; and when veterinary surgeons know that they may be called upon

to undertake the honorable office of examiners in anatomy and physiology, they will strive to add to the knowledge of these subjects they may have acquired at school, so as to get above the knacker and blacksmith stage of learning, and acquit themselves of their duties as creditably as their professional colleagues at the other examination sections.

My interest in this matter, it is scarcely necessary to state, is entirely independent of every motive but that centred in the good of veterinary science.

I write neither as a teacher, an examiner, a civil practitioner, nor yet a co-editor of the *Veterinarian;* but simply as an independent member of council, and one who is sincerely anxious that veterinary science may be as self-respectful and as self-reliant as medical science is.

I have, it is true, spoken "much of the necessity of veterinary science becoming a more effectual helpmate to the sister science of medicine," as the leading article says; but I never for a moment entertained the idea that one science was helping the other in advancing knowledge by continuing an absurd system of examination. On the contrary, I maintain that the system is hurtful to the progress of veterinary science in this country, and does no good whatever to human medicine. It has been in existence for eighty years, and yet it seems our notions of anatomy and physiology are no better than those of the knackerman and blacksmith. Who in the profession would, after this, insist on the continuance of such a system?

The two branches of medical science will aid each other when the veterinary student is as thoroughly taught as is the medical student; and when the medical man, having carefully studied comparative pathology, and availed himself of the facts already acquired by his colleagues in the sister profession, can apply the results of his study for the benefit of his species.

Allusion has been made to "precedent" and "bye-laws." A precedent is only valuable so long as the circumstances on which it was founded continue to exist; and a bye-law is not as fixed as the laws of the Medes and Persians, but comes within the category of those which allow of modification and amendment to any extent.

In this instance precedent and bye-law are not insuperable obstacles to progress, if the step be deemed advisable. Let us remember that veterinary examiners have a direct interest and responsibility in performing their duty efficiently; medical examiners have none.

BURSATIE.

By Robert Spooner Hart, M.R.C.V.S., Calcutta.

Stimulated by the text *Quod erat inveniendum*, and the conflicting opinions which I have heard expressive of the comparative position which the disease "bursatie" held to human pathology, I have been induced to pen the accompanying observations.

For some time past this disease and its existing theories have occupied my attention; and as a result I feel almost certain that I shall succeed in making clear what Bursatie is; and should I do so, and never having seen anything on the subject, I may reasonably presume to claim for myself the right of having thrown a light on one of the most virulent maladies to which horseflesh is heir. Bursatie, from the Hindoostanee word "Bursat," meaning rain, is the native name of a disease, and, in fact, the only one it goes by, which prevails during all months of the year, but assumes a more protracted and aggravated form during the rains, which in India last from May till August. I remember during the period mentioned in 1869 that the disease was very rife and of a protracted form, the season being notorious for an elevated temperature with excessive humidity. To those unacquainted with the disease I would state that it is one characterised by the formation of hard patches or tumours under the skin, having as their special character a tendency to enlarge, spread, and ulcerate, and to be accompanied with a decline of the general health. The disease is almost certain to recur, and the sores are notorious for an extreme vegetative luxuriance and an exuberant vitality.

"Bursatic" sores become more malignant and severe in their latter stages than in their earlier. They recur also very much quicker and the ulcerative process is more rapid at that time, until at last the patient, from constant emaciation, dies exhausted, or the case terminates in the declaration of symptoms allied to farcy or glanders. The tubercles show a decided tendency to form on particular parts, and most obstinately refuse to be eradicated from the site of their first development. They occur on the extremities, face, lips, neck, conjunctiva, cartilago-nictitans, anterior parts of the body, scrotum and penis, &c. So far as I am aware, the disease is peculiar to the tropics, and is said to be contagious and infectious; but with reference to this and its hereditary

nature, I shall say more hereafter. For comparison, I propose to give a brief description of morbid developments, and for brevity sake shall define a tumour as a morbid product, possessing an inherent power of increasing in size, as the result, perhaps, of indirect or ill-directed growth-force, or perhaps originating from matter exuded from the blood, and due to some unknown cause. Such growths, as a rule, are unimpeded by any remedial means that have hitherto been devised.

Pathologists divide morbid growths into three classes:

1. Classification by structure.
   (*a*) Benign; (*b*), malignant; (*c*) semi-malignant.

Malignant growths are said to possess fifteen characteristics:

1. Attended with pain.
2. To progress constantly.
3. Their progress to be generally rapid.
4. To have a constitutional origin.
5. To return, if cut out.
6. To be attended with a cachexy.
7. Liable to secondary deposits.
8. Likely to become diffused over the body from increase of the materies morbi.
9. Possess a tendency to soften inwardly.
10. Are heterologous in structure.
11. Resist all treatment.
12. Invade the lymphatics.
13. Ulcerate outwardly.
14. To infiltrate tissues in their vicinity.
15. To ultimately prove fatal.

The only morbid growth possessing all these marks is cancer.

Semi-malignant growths include those which are very much like cancer; but do not possess all the characteristics of that fatal malady. All tumours are said to be of constitutional origin, and liable to return after extirpation, and to invade internal organs; some growths also show a tendency to return *in sitû* after removal; and others to take on malignant action.

Dermatologists speak of an order called *Tubercula*, which, as applied here, does not signify tuberculosis. I make this remark to prevent misconstruction by those who argue that bursatie is allied to tuberculosis.

Tubercula may be defined as little globular tumours, firm or

soft, containing no fluid, formed deeply in the substance of the skin, at times disappearing by absorption; at others ulcerating, accompanied by loss of substance, more or less extensive. Included under this head are elephantiasis, keloid, frambœsia, cancer, epithelioma, rodent ulcer, and, I think, with propriety, we may also include bursatie.

The preceding remarks I have laid as a foundation, and will now continue the subject by saying that the disease is not so common as is generally considered. By this I refer to horses in the better station of life; but, on the other hand, the disease is as common as possible and of a most virulent type among the horses in the lower station of life, particularly those used in the native hackney carriages, which consist chiefly of ponies. Simple sores and ulcers are of very common occurrence on the legs of horses, and should a sore, either from its shape or position, give some trouble in healing, it is often pronounced to be bursatic. This dread of bursatie is not so much to be wondered at, when we see that the affection possesses many of the characters of malignancy.

The clinical history of bursatie varies as occurring in different subjects. A case may present itself with solitary or multiple tubercules which at first are subcutaneous, and the skin covering them to all appearances healthy; but after a time a loss of hair takes place on the central part of the deposition (tubercles), which appears to have become irritable, and interfered with as to nutrition, and in consequence congested, swollen, and softened. At length the part ulcerates, which ultimately results in the formation of a large sore.

The surface of the ulcer so formed presents a variable appearance; it may be clean and pinkish, or of a brown or brick-red colour, exuding a discharge; or it may become scabbed. The loss of substance, as a rule, increases superficially; very rarely deeply. One part of the sore may be healing whilst the other portion is in an ulcerative state. When this is the case the healing is usually attempted at the upper part of the sore, for the ulceration generally commences at the upper portion of the tumour first, and extends more rapidly in a downward direction over that part of the tumour which is constantly wetted with the acrimonious ichor exuded by the sore. The edges may be irregular, undermined, and everted, or inverted with more or less infiltration of the textures beyond the circumferent margin of the sore. After a time more or less papillation takes place, which by increasing forms luxuriant growths, quite hard, and presenting a fungous cauliflower-like excrescence. The healing is accompanied by distinct and most prominent

scarring, which to the experienced eye is quite a sufficient tell-tale as to the nature of the disease. The cicatrices on the extremities are of a warty or horny nature, and are continually giving off flakes of semi-horny material, whilst those on the body consist of a thin black pellicle of delicate tissue, slightly corrugated on its surface, and readily ruptured, in fact, presenting appearances like the cicatrices produced after the healing of a burnt wound. The term bursatie is applied indiscriminately to all sores, more or less, without reference to their benign or malignant nature; but I conceive that true bursatie has three distinct forms or stages.

(*To be continued.*)

EXPERIMENTS WITH CARBOLIC ACID.

By P. Cullen, M.D., Calcutta.

June 1st, at 7.27 a.m., ʒss of carbolic acid was given to a little dog; in one minute he was a good deal agitated, and moved about in jumps, carrying his hind legs under him. In three minutes he lay down, got up again and staggered about a good deal. In five minutes ʒij infusion of valerian (Pharmacopœia strength) was given to him, after which he fell down, lay quiet for one minute, then got up and sat on haunches. In nine minutes he sank into a half sitting and half lying posture, and was panting a good deal, and for some time kept changing his position, sometimes sitting, and sometimes lying down. In fifteen minutes the symptoms began to decrease. At twenty minutes after the dose, a little cold water was sprinkled on his head, when he got up, and was enabled to stand. His strength gradually returned, and in fifty minutes' time he was all right. In this experiment there was no stertorous breathing, nor frothing at the mouth.

June 13th, at 7.38 a.m.—Forty minims of acid were given to a little dog; he immediately staggered and fell; got up and fell again some three or four times. In three minutes he fell, and was unable to rise. In five minutes ʒij infusion of valerian was given. At 7.48 there was stertorous breathing, frothing at the mouth, pupils dilated and eyes bloodshot, and he lay quite helplessly. At 7.54 he attempted to rise but could not; but at 7.56 got up, but was unable to stand, and fell again. By 8 o'clock the symptoms began to wear off, and by 8.20 he was quite himself again.

14th.—ʒj of acid was given to the same little dog at 7.26 a.m. In two minutes he was frothing at the mouth and staggering about. In six minutes he sat down, and then quietly lay down. In eleven minutes he got up, sat, and staggered about until the fifteenth minute had elapsed, when the symptoms began to wear off, and in one hour and five minutes he appeared all right. In this trial the dog was not entirely overpowered, but seemed to have a power of resisting the effects of the acid.

17th July.—At 7.35 a.m. forty minims of acid were given to to the same dog in ʒss of water. In five minutes he was affected with a hoarse rattling noise in the throat, was a good deal agitated, and walked about with his hind legs under him; after the tenth minute he sat down, and got up several times. In fifteenth minute he passed urine and vomited once, and then rapidly recovered, and by 8 a.m. was all right.

19th July.—At 7.38 a.m., ʒj of acid was again given to the same little dog. In two and a half minutes he trembled greatly, had a hoarse rattling in his throat, and moved along in a half sitting posture with the hind legs under him. There was also twitching of the eyelids; pupils dilated. At 7.45 he fell and with difficulty got up and remained more or less affected, but not overpowered until 8.20 a.m., when he quite recovered.

5th December.—The same dog was not found out; two others about the size of water spaniels were secured.

5th December.—At 8.46 a.m. dog, No. 4, got acid ʒj, in water ʒiv; he fell instantly, and in thirty seconds gr. iij of Calabar bean powder, with ʒss of water, were poured down his throat. He was strongly convulsed and died in seven minutes.

At 8.51 a.m. dog, No. 5, took ʒss of acid in water ʒiv. In thirty seconds he was frothing at the mouth, and in one minute fell down convulsed; in ten more seconds sat again and continued half sitting and half lying for five minutes, pupils dilated, eyes watering. After this the symptoms gradually wore off, and he was all right in about forty minutes.

At twelve o'clock midday a *post-mortem* of dog, No. 4, was made. The lower lobes of the lungs were slightly congested. The four cavities of the heart were distended with fluid blood; in the right auricle only was there any sign of coagulation, and here only a small soft coagulum was found. Stomach contained some half digested food, and at its œsophageal end exhibited spots of redness; similar spots seen along the intestinal canal. Liver quite dark and gorged with fluid blood. The kidneys and bladder were full of red urine, which smelt strongly of the acid. The vessels of the brain were full of fluid blood, but no particular vascularity was

seen in the brain substance; each lateral ventricle contained a small quantity of serous fluid.

6th December.—Dog, No. 5, at 8.30 a.m., was thin and frothing at the mouth, nevertheless ʒss of acid in ʒiv of water was given, and immediately after gr. iv of Calabar bean powder which had been steeped for ten minutes in ʒij of spirit of wine, was also given; he fell and was strongly convulsed. In two minutes he was put in warm bath and was kept in for one minute without any apparent benefit. He died in ten minutes from the time of taking the acid.

Post-mortem at twelve o'clock midday.—All internal organs gorged with blood as in No 4; there was also serous effusion on the surface and in the ventricles of the brain. The spine from the shoulders to the sacrum was laid open, but no effusion or signs of inflammation could be detected in the cord or its sheath.

7th, at 8.10 a.m.—ʒss acid in ʒiv of water was given to dog No. 6. In thirty seconds he was staggering about. In two minutes he was put into hot bath and kept in for two minutes, then taken out and wrapped in a blanket; this served to check the spasms, but not the heavy breathing. At 8.20 he got up, and the effects of the dose had quite worn off by 8.30 a.m.

Thinking that, perhaps, the Calabar bean had something to do with killing dogs No. 4 and 5, I caught another dog on the 7th December and gave him gr. ij of powdered bean in a ʒiss of spirit. vini, with ʒij of water. In three minutes he coughed a little, and then vomited; the cough continued at intervals for about twenty minutes, but no other effects were noticeable. On the next morning (8th December), however, a weakness in his hind quarters was quite evident, as seen by the way he walked.

At 8.48 a.m. gr. ij of Calabar bean powder in cold water was given; he vomited immediately, but no further effect followed, nor was the weakness in his gait more evident the next day. From this I attribute the death of dogs 4 and 5 solely to the carbolic acid.

On the 13th of December, "Culloo," a prisoner, Hindoo, aged 22, was admitted into hospital, complaining of purging; stools semi-fæculent, frothy, with mucus in them; tenderness of descending colon; straining at stools; no fever. Gave dose of Ol. and the next day gallic acid with opium three times. No improvement on morning of 15th. I then gave carbolic acid ℥iij, c. tinct. opii ℥xv, in ʒss camphor water. On 17th his stools were natural; the medicine omitted. He was discharged cured on the 18th.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 531.)

Although it is doubtful whether the *Nepenthaceæ* are rightly placed in the Euphorbial alliance, we follow Professor Lindley in reviewing it now, for the reason he has so tersely expressed—"it seems difficult to find any better place for the Order."

The interest is the Nepenthes centres in the curiously formed leaves, from which their common name of "pitcher plants" has been derived.

In order to understand the nature of the foliage in these plants, we would first quote Lindley's diagnosis of these parts. He describes the Nepenths as "herbaceous, or half-shrubby caulescent plants. Leaves alternate, slightly sheathing at the base, with a dilated foliaceous petiole, pitcher-shaped at the end, which is articulated with a lid-like lamina."

The pitcher, then, may be considered as a hollowed expansion of the *petiole*, or leaf stalk, possessing a delicately-formed lid, which is the representative of the true *pagina*, or leaf. This latter part is here not sufficient to carry on the leaf-function, and this is provided for by a leafy expansion at the base of the petiole. Dr. Hooker follows Dr. Griffith in differing from this view. These authors agree that the basal portion, that which appears like an ordinary leaf, is the true lamina, tapering downwards into a more or less evident stalk; and that the pitcher-like appendage is a modification of the prolonged midrib of the leaf, or, rather, of a gland situated at the apex of the leaf. We prefer the first view.

No less curious is the seed of these plants. The germ is placed in the centre of a loose tunic, which is lengthened into a straitened process at one end, and the same slightly curved at the other, an arrangement which enables the seed first to perform the act of a buoy to float it on the surface of the water, and when it arrives at the mud to anchor therein, until it has germinated. A more complete method for ensuring the proper rooting of a plant native to swampy ground can hardly be conceived. The pitchers of *Nepenthes destillatoria*, from secreting a watery fluid, give a name to the plant. This secretion was at one time supposed to be

pure water, but Dr. Voelcker has shown that it contains some very important salts. The following are his results:

Composition of the fluid in the Ascidia of Nepenthes.

"Organic matter, chiefly malic, and a little citric acid; chloride of potassium; soda; lime; magnesia."

Prof. Lindley tells us that "the water contained in an unopened pitcher of a plant which flowered in the Botanic Garden of Edinburgh was found by Dr. Turner to emit, while boiling, an odour like baked apples, from containing a trace of vegetable matter, and to yield minute crystals of super-oxalate of potash on being slowly evaporated to dryness."

Besides the *N. destillatoria* there are about thirty other species. They are not remarkable for any particular property, and the great interest with which they are viewed, on account of their peculiar structure, forms the sole attractive feature connected with them.

QUERNALES.—*Quernal Alliance* consists of a large group of very magnificent plants, the types of which may be recognised in the Walnut and the Oak.

The alliance is remarkable for containing only two natural orders, and these again possess but few genera, but at the same time the species are very numerous, and specific differences are in this tribe of unusual importance. Thus, for example, some species of oak are highly valuable for use as timber, whilst others are comparatively useless. The fruits, and even the galls of certain species, are of value, while those of others are of little, if any, service.

The *Quernales* are described as Diclinous Exogens, with amentaceous monochlamydeous flowers, an inferior fruit, and an amygdaloid embryo without albumen.

The natural orders are distinguished as follows:

1. JUGLANDACEÆ.—*Ovary 1-celled, ovule solitary, erect.*
2. CORYLACEÆ.—*Ovary 2 or more, celled ovules pendulous or peltate.*

1. The typical tree of this order, *Juglans regia.* The common walnut is too well known to need scientific description. It is a tree of large size, and though of only a comparatively recent introduction to this country, we can boast some noble sized trees; and the walnut and hickory trees of North America are both striking and valuable.

Of the former, Beck describes two, and of the latter six, species from North America, belonging to the genera *Juglans* and *Carya.* We would now speak more particularly of the

classic walnut, to which Mr. R. Thompson, in the 'Treasury of Botany,' refers as follows:—"It was said that in the golden age, when men lived upon acorns, the gods lived upon walnuts, and hence the name of *Juglans*, *Jovis glans*, or Jupiter's nuts. The Romans called the walnut *Nux persica*, *Nux regia*, *Nux rubæa*, *Jovis glans*, *Dijuglans*, *Juglans*. Greek authors mention it under the names of *Carya*, *Carya persica*, and *Carya basiliki*, or Royal Nut. We are not aware that the common English name of walnut has been satisfactorily explained. On the contrary, we think an erroneous derivation has been given. Walnut, they say, is from Gaul-nut, presuming at the same time that the tree had been introduced from France into this country. But our learned ancestors, in their ordinary language, did not, nor did the common people, use the classic names of Gaul in their designation of things introduced from France in comparatively modern times. Walnut is doubtless of German derivation. In that language we find it sometimes written *Walnuss*, sometimes *Walschenuss;* the latter appears to have been the original.

"Wälsch simply means foreign; hence Walschenuss, a foreign nut, properly applied to the walnut, as regarded Germany, as well as the rest of the Continent of Europe. In Dutch it is called *Walnoot*, and its English, Danish, and Swedish names are modifications of this and the original German term."

As we have before stated, the walnut grows to a noble tree even in Britain, though an adopted home, as many living examples testify in almost every English county; but there is reason to think that many of our best trees fell a sacrifice during our wars with France, on account of the high price commanded by the wood, which is light, while it is tough, and withal takes a fine polish, and therefore it has always been a favourite in the construction of gun-stocks.

It is highly esteemed in cabinet work, and though, perhaps, the introduction of mahogany has tended to put walnut wood somewhat in the shade, it is still very highly valued as one of our most useful and ornamental kinds of wood. The fruits or nuts, in the green state, are in great repute for pickles and sauces, and the ripe fruit is everywhere relished as an addition to the dessert. With us, however, the dried fruits are not so much in use as on the Continent, where they are dried with great care; and at the Exhibition of 1862 some hundreds of samples of dried walnuts were sent from different countries, especially from Turkey and Greece.

It is, however, as a timber tree, and that, too, most effective and handsome in its combinations, and especially about the homestead, that the walnut is most valuable.

The author just quoted tells us that a tree "accurately measured by Professor du Breuill, of Normandy, was upwards of twenty-three feet in circumference; and in some parts of France there are walnut trees, 300 years old, with stems of much greater thickness. In southern parts of England the trees grow vigorously and bear abundantly when not injured by late frosts in spring." He goes on to say—"Trees of choice quality of wood have been sold for £600 each. Its plantation, therefore, should not be neglected, but not too near dwellings, as some persons are affected by the powerful aroma of its foliage."

Evelyn states that Burgundy abounded with walnut trees, "where they stand in the midst of goodly wheat lands, at sixty and a hundred feet distance, and so far are they from hurting the crop, that they are looked upon as great preservers, by keeping the ground warm, nor do the roots hinder the plough;" and he adds, "that in several places betwixt Hanau and Frankfort, in Germany, no young farmer is permitted to marry a wife till he brings proof that he is the father of a stated number of trees, and the law is inviolably observed to this day, for the extraordinary benefit the tree affords the inhabitants."*

Loudon states that, in France, about 1806, no less than 12,000 were annually required for musket-stocks.

All honour, then, to the planter of the walnut tree. We had as lief put our legs beneath the walnut as the mahogany, as the wood is, in our opinion, of a finer texture and colour, and this we can grow at home, meanwhile enjoying its fruit. It is a handsome tree, towering upwards to the sky, and so doing but little mischief to the farmer; and its growth would surely be more profitable, if put here and there in convenient places, than the miserable topped elms, which are truly a destructive weed to many an English farm. And yet landlords are sometimes so chary of their rows of these that they will rather allow them to be trimmed to the shape of a French poodle's tail than have any of them rooted out, and that, too, where they are so thick as to ruin each other.

* Quoted from Selby's 'Forest Trees.'

ALSIKE CLOVER.—ITS REPUTED ILL-EFFECTS ON ANIMALS.

By J. Wheeler, M.R.C.V.S., Rookley, Isle of Wight.

In reply to Mr. Earl's inquiries respecting Alsike clover being poisonous or injurious to horses, I can inform him that the farmers in this island are so well convinced of the ill-effects of the plant that they have ceased to grow it. A few years ago, when Alsike clover was grown here to a great extent, I saw six or seven teams of horses which were seriously injured by eating it in a green state; and I also have since heard from a large stock-farmer that lambs frequently suffered in a similar manner if fed upon it.

When mixed with other clover or grasses, Alsike clover does not seem to cause any injurious effect; but I remember to have seen two teams of horses affected by eating Alsike clover-hay. Usually horses continue to feed on the plant for a week or ten days before showing any indications of its ill-effects.

The symptoms which Mr. Earl relates exactly correspond with those I have witnessed. A change of food and the exhibition of a mild aperient, followed up occasionally with tonics, will soon bring about recovery.

I am somewhat surprised that we have not heard more of the injurious effects produced on animals by eating this clover, as I understand it is largely cultivated in the northern parts of England as well as elsewhere. A few years since, my father drew the attention of the profession to it through the *Veterinarian*, which led at the time to a free discussion of the subject.

[If our readers will refer to the thirty-seventh volume of the *Veterinarian* they will find the discussion alluded to, and also a history of the introduction of this plant from Sweden, to which country this hybrid clover belongs.—Eds.]

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"Return of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of July, 1872, have been found to be affected with any Contagious or Infectious

Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Antwerp .	London .	Foot-and-Mouth	...	1	...	...	1	1
Cronstadt .	Hull . .	„	8	...	...	...	8	8
„	London .	Cattle Plague	4	...	...	...	4	3*
Hamburg .	Grimsby .	Foot-and-Mouth	...	7	...	...	7	7
„	Hartlepool	Cattle Plague	1	...	...	...	1	1
„	„	Foot-and-Mouth	2	3	...	...	5	5
„	Hull . .	„	22	98	...	...	120	120
„	„	Sheep-Scab .	...	12	...	...	12	12
„	Leith . .	Foot-and-Mouth	...	36	...	...	36	36
„	London .	„	57	...	...	...	57	57
„	Middlesborough	„	1	6	...	...	7	7
„	Newcastle-on-Tyne	„	8	5	...	...	13	13
„	Newcastle	Cattle Plague	3	...	...	...	3	2*
Harlingen .	Hull . .	Foot-and-Mouth	38	...	...	...	38	37*
„	Newcastle-on-Tyne	„	5	2	...	...	7	7
Nieu Dieppe .	Hull . .	„	...	2	...	...	2	2
Nordenhamm .	„	„	19	...	...	...	19	19
Rotterdam	Grimsby .	„	...	...	...	2	2	2
„	Harwich .	„	...	...	...	4	4	4
Total . . .		Foot-and-Mouth	160	160	...	6	326	325*
„		Sheep-Scab .	...	12	...	...	12	12
„		Cattle Plague	8	...	...	...	8	6*
Total . .			168	172	...	6	346	343*

"Privy Council Office, "ALEXANDER WILLIAMS,
"Veterinary Department, 11th July, 1872." Secretary.

* "One animal affected with Foot-and-Mouth Disease, and two animals affected with Cattle Plague, died at the place of landing."

CATTLE PLAGUE.

Our last reports from St. Petersburg represent the cattle plague to be exceedingly virulent in the Baltic provinces of Russia, and to have reached to within twenty miles of the capital.

From Hamburg we also learn that the disease has reappeared in a field about a mile from the place in which the previous cases occurred. An ox and two cows having died suddenly, a *post-mortem* examination was made, which fully confirmed the existence of cattle plague. The remaining cattle, consisting of eleven cows and two goats, some of which had begun to show symptoms of the disease, were consequently killed by the instruction of the authorities as quickly as possible. The carcases were disposed of in the manner employed in France, viz. they were put into a large pit, which was then filled with tar and set on fire.

It is thus evident that the cattle plague has now existed in the neighbourhood of Hamburg for upwards of a month, notwithstanding the energetic measures which have been adopted for its extirpation. Imports of "cattle of all races" from Russia, and also of animal products from that country, are strictly forbidden.

Denmark has also interdicted the importation of Russian cattle and all substances which have been in contact with them, and even refused to allow any communication between the shore and cattle steamers from the Baltic. She has, besides, taken steps to guard the Schleswig-Holstein frontier.

In spite of these precautions, reports of the existence of cattle plague among some cattle imported from Denmark have been published. The following alarming paragraph from the *Medical Press and Circular* we quote for the purpose of remarking that it is happily without any foundation:

"The rinderpest has appeared at Edinburgh and Leith. The infected cattle came from Denmark and Iceland. Combined with rinderpest is the foot-and-mouth disease, which seems to be of a peculiarly virulent character, five of the infected animals having died."

The supposed rinderpest was nothing more than a virulent form of foot-and-mouth disease, a form not uncommon among foreign cattle, in which the lesions of the buccal membrane are occasionally not unlike those of cattle plague.

From Pesth advices state that the kingdom of Hungary is

free from cattle plague, although it is still very prevalent in Galicia and in two districts of Lower Austria.

The disease also exists in Scutari and in the Island of Leti, at the mouth of the Danube.

We add to the report of the reintroduction of the cattle plague, as published in our last number, the particulars of three other cases which took place on the eve of its publication. The first of these imported cases was into London, the second Hartlepool, and the third Newcastle, all of which ports had previously had diseased cattle sent to them.

In the case of London the cattle were all Russian, shipped at Cronstadt. They numbered thirty-five, and were brought in the *Viatka*. The vessel left Cronstadt on July 20th, and on her way called at Copenhagen, a circumstance which probably has given origin to the report of cattle plague being in Denmark. It is believed, however, that no cattle went ashore at that port. Leaving Copenhagen, she made London, and landed her cattle during the night of July 28th at Deptford. When first seen by the inspector, three of the animals were found to give indications of ill health, the others being far more prostrated from the voyage than is ordinarily the case. The diseased animals were at once killed, and an examination showed that the suspicion of their being infected was fully confirmed. All were destroyed by the steam process in use at the market.

It was subsequently ascertained that five beasts had died on the passage, and, doubtless, every one of them from cattle plague. The first died early in the morning of the 26th, and two others during the same day. The fourth and fifth died on the 28th, the day of landing, the last so near our shores as to have the carcase disposed of by throwing it overboard near the "Sunk Light" off Harwich.

In the Hartlepool case twenty-six *German cattle*, from Hamburg, were landed from the *Gipsy Queen* at about 5 a.m. on July 29th. The vessel arrived in dock late on the previous night, and was boarded by the inspector, who did not then detect any disease among the cattle, nor at his next examination, which was made immediately after they were landed. On his final examination, made after twelve hours' detention, symptoms of illness were detected in one animal, and the whole were consequently detained, that the true nature of this illness might be ascertained, every precaution being taken to prevent mischief resulting in the event of the disease proving to be cattle plague. Within a few hours not only were the symptoms of cattle plague fully established in this animal, but others of the cargo began to sicken with the

disease. Slaughtering was immediately had recourse to, but so rapidly did the malady progress that by 4 p.m. of the same day, when we arrived at the dock, no less than ten out of those still awaiting slaughter were found to be affected with the disease. The local authority was promptly communicated with; the dock-house surrounded by the police, and every means adopted by disinfection and otherwise to prevent infecting material leaving the place. As quickly also as arrangements could be made, the whole of the remaining animals were killed, one of the diseased having died in the interim, and their carcases, with the "dressed bodies of beef," skins, and offal of every kind, put into a lighter, and sent by water to a proper burial place, which could be thus reached without any of the remains having to be carried on the land. The rapid progress of the disease in this instance, together with the cattle being all of German breed, were convincing proofs that the cattle plague, which had been conveyed from Russia to Hamburg, had gained a footing in Holstein.

The Newcastle case was similar to the Hartlepool in so far as the cattle being all of the German breed, and imported from Hamburg. They numbered 103, and were landed from the *Brigadier* on the morning of July 29th. At that time they all appeared perfectly healthy, and the inspector had no suspicion of any disease until he saw the animals a few hours after landing. One animal now appeared slightly indisposed, sickening, in fact, for disease, but of what kind could not yet be satisfactorily ascertained. Acting on the impression that the disease might prove to be cattle plague, the inspector had the animal at once isolated, and all the others put in charge of the police. Within a few hours the existence of cattle plague was fully established; the animal was therefore at once killed, and the carcase destroyed, and everything round and about the place thoroughly cleansed and disinfected. The slaughter of all the others was also immediately commenced, and completed as rapidly as possible; every means being adopted with reference to the disposal of the skins and offal which could give security against the diffusion of cattle plague infection.

Advantage has been taken of the reintroduction of cattle plague to test the alleged conveyance of the disease to animals by their partaking of water containing the *materies morbi* of the malady. Some exudation matter and viscid mucus were removed from the fauces of a diseased German cow and mixed with a pail of water, which was then given to a yearling heifer to drink. She refused to swallow more than a draught or two; but being kept from water for two succes-

sive nights and a day, she freely partook of the remainder. On the third day following the last drinking of the water she presented appearances which to the practised eye indicated that mischief was beginning, and an application of the thermometer test was had recourse to, which showed that the temperature had already risen to $105\frac{2}{10}$. On the following day the symptoms of cattle plague were well marked, and from that time the disease progressed so rapidly that death followed on the *fourth day of illness, and ninth* from the time the infected water was first partaken of.

It may be right to add that the experiment was carried out under circumstances which rendered it impossible that the animal could in any other way, save by drinking the water, have been exposed to the infecting material of cattle plague. Its result fully confirms the opinion arrived at during the prevalence of the disease in 1866, and establishes the views held by the best of the continental observers.

FOOT-AND-MOUTH DISEASE.

This malady continues to prevail, in some districts, in a very virulent form, and although the deaths which take place still constitute an insignificant per centage, the aggregate loss to the agricultural interest is great, arising from waste of condition in so many thousands of animals as are now affected. One noteworthy feature of the disease is its great severity and extraordinary prevalence among sheep, a circumstance which brings forcibly back to our minds the state of things as existing in 1840—1. At that period thousands of sheep suffered to such extent that the horny coverings of their digits were detached as completely as they would have been by the process of scalding after death. A visit to "old Smithfield" was sure to bear witness to the fact that on each market-day scores of sheep were standing on hoofless feet, and that the detached hoofs could be picked up by dozens. Then, as now, pigs and poultry also suffered greatly, pigs being affected in their feet in a similar manner to sheep. According to recent observation, deer have likewise been attacked with the malady. This has been especially the case in Bushy Park, Hampton Court, where the animals are supposed to have received the infection through being exposed to some diseased cows.

As we have often observed, these periodic outbreaks of foot-and-mouth disease in its malignant form are problems yet to

solve. Much as we know about the laws of contagion, there are difficulties in the way of understanding their operation in all cases in which foot-and-mouth disease is manifested. No one can doubt, who has had experience of the malady, that, like the *materies morbi* of cattle plague, the infecting matter of "foot-and-mouth disease" can be *indirectly* carried to healthy cattle, with almost a positive certainty of affecting them; but knowledge of this kind frequently fails to account for many of the outbreaks, as well as for the great distances which lie between the site of the disease and its fresh victims of attack. We have again and again known cattle to become affected which were isolated as completely as possibly could be supposed, and when too it could not be ascertained that any cases of the disease existed within a distance of many miles of the place. It is facts of this kind, among many others equally perplexing, that throw doubts upon the stamping-out process being effectual for the complete extermination of the malady, to say nothing of the certainty of the re-introduction of the *materies morbi* from other countries from time to time. Besides this, it should never be lost sight of that in adopting whatever course we may to rid the country of foot-and-mouth disease, the malady was equally as virulent and as widespread in England before foreign cattle were permitted to be imported, as it has been at any time since.

Under these circumstances we shall watch with much interest the doings of our Australian brethren. From the Victorian *Economist*, June 14th, just to hand, we learn that the new ministry of the colony have appointed a Commission and issued orders, under an Act which was only passed on the 11th of June, for the "instant inspection, careful investigation, and destruction of the infected animals, as well as of all that have come in contact with them."

The Commission, it seems, has gone to work in earnest, as they have not only slaughtered the cattle, but placed the farms on which they were found in quarantine for six months, and disinfected every person and thing leaving the locality. The *Economist* praises these measures, but demands that they shall be supplemented by the "slaughter of animals coming from infected countries at the place of landing."

Will stamping-out succeed? and if so, for how long? In our own country there has been some talk of sending a memorial to the Privy Council to close all fairs and markets for six weeks; but it is scarcely probable that the cattle trade will submit to such an interference, especially as the benefit arising from such a measure is not at all likely to be permanent.

PLEURO-PNEUMONIA.

There have been several fresh outbreaks of the disease in different parts of the country, and in some rather a serious extension of it has taken place. As might have been expected, disputes have arisen between non-professional inspectors and veterinary surgeons as to animals being the subjects of the disease or not; and in several such cases we have been asked to examine specimens of diseased lungs, that we might confirm the professional opinion of the existence of the malady. This is an evil which has been created by the local authority, and it is no small one for the country to have to sustain in these days of the rapid spread of infectious diseases among cattle.

In a few instances inoculation has seemed to afford some protection against infection, but in many others the disease has ceased after attacking two or three animals of a herd, even when no such precaution has been taken. The peculiarity of pleuro-pneumonia is its long period of incubation, which gives ample time, on the discovery of an outbreak, for the separation of the sick or suspected from the healthy, and the slaughter of those which are ready for the butcher, thus lessening the number of susceptible subjects.

In many of the London dairies the disease maintains its usual rate of prevalence, and there is good reason to believe that the facilities which now exist for the removal of cattle out of the metropolis have had to do with some of the recent outbreaks of pleuro-pneumonia in country districts.

In the Netherlands the disease has considerably decreased.

SMALLPOX OF SHEEP.

This disease is again on the increase in several of the North German provinces which lie on the shores of the Baltic. From Pomerania we learn that many cases have recently occurred; but under the existing "Order" with regard to German sheep and goats we shall in all probability be protected against injury arising to our flocks, even if sheep-pox should be again introduced.

CHANGE OF COLOUR IN A HORSE FROM A *BRIGHT BAY TO A BLACK COLOUR.*

Mr. Hedley, of Darlington, informs us that, about eight months ago, he was requested to attend a bay carriage

horse, the property of Arthur Pease, Esq., of Hummersknow, near that town, which the coachman said had not been doing well for the past few weeks. The horse fed badly and was losing condition. Mr. Hedley's diagnosis of the case was that the horse was suffering from some simple derangement of the digestive organs, and that this was probably associated with the existence of worms, of which there were some indications.

Some alterative and anthelmintic medicine was administered, and followed up by tonics. The horse improved considerably under this treatment, but still did not present that same glossy appearance of his coat that his companion did. In the month of May last similar means were adopted for the improvement of his health, after which he was turned out to grass on the 15th of June, in a field situated near the river Tees, in company with a two-year old colt. Here he remained till the 8th of August, when he was taken up to be prepared for work. He returned apparently in blooming health, fat, and glossy in his coat, but instead of being a *bright bay*, as he was when he was turned out, he was now *perfectly black* in colour. The horse has been in Mr. Pease's possession for about two years and a half, and is now seven years old. What adds to the singularity of the case is that no change of colour ever took place in previous moultings.

Facts and Observations.

Re-appointment of Veterinary Surgeons as Inspectors.—At the special general court of quarter sessions, held at Bedford in the first week of August, Mr. H. Thornton called attention to the great increase of cattle disease in the county, and as it was spreading to a very great extent he urged the necessity of taking immediate measures to counteract it and prevent its propagation.

The Chief Constable stated that there were now 7,450 infected animals in the county—cattle, sheep, and swine. Thechairman (Mr. Harvey) thought that the most stringent measures should at once be taken, if possible. Mr. Bassett, M.P., was under the impression that *it was a penny-wise and pound-foolish policy to employ the police as inspectors, as they were not familiar with the premonitory symptoms of disease.* The Rev. J. Clegg and Colonel Ames bore testimony to the spread of the foot-and-mouth disease in their respective localities, as did also Colonel Lindsell and other justices. On the

suggestion of the Chief Constable, the court resolved that the notices already in force as to the removal of infected animals be printed and forwarded to the farmers of the county, and be posted up in different localities.

On the motion of the chairman, seconded by Mr. Bassett, M.P., *the veterinary inspectors who had been employed during the rinderpest outbreak were re-appointed, the question of their remuneration being left open.*

Misrepresentation of the Contagious Diseases (Animals) Act.—On the morning of Aug. 26th a large number of persons assembled in public meeting on Clerkenwell Green to consider the cause and remedy of the present high price of provisions. The meeting was convened under the auspices of a Society terming itself the London Patriotic Society. The Chairman, in opening the proceedings, referred to the famine prices which most provisions fetched at the present time, and said that working people could not now afford meat once a week. He strongly condemned the working of *the Contagious Disease (Animals) Act*, which he said was passed as a system of protection in the interests of home breeders, and of which a nation which professes to be composed of freetraders, should be ashamed.

The Government should be applied to on the subject, although he did not know that anything could be done without the repeal of the Act.

Mr. Riddler then moved, and Mr. Mullins seconded, the following resolution:—"That this meeting protests against the present working of the Contagious Diseases (Animals) Act, in reference to the restrictions in the importation of foreign cattle, as they are certain such prohibitions are not used at present to prevent disease, but to establish a system of protection in the interest of home breeders, which, as a nation pledged to free trade, ought no longer to be tolerated." This was carried.

A Good Example.—The local authorities of Bordeaux are about to elect by "*concours*" an officer to hold the appointment of Town Veterinarian and Inspector-General of Food and of the public *abattoir*. His salary is to be 4000 francs (£160), with a residence at the *abattoir*.—*British Medical Journal.*

THE VETERINARIAN, SEPTEMBER 2, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

CATTLE PLAGUE.

As far as danger resulting from the recent importation of plague-infected cattle is concerned, we may consider ourselves safe. The longest period of incubation of the disease has passed nearly three times over since the last cargo of diseased beasts was landed on our shores. Probably some of the carcases, or portions of them, which were consigned to the deep, may yet be washed on the coast somewhere, but we confess that we do not entertain any grave apprehension on that account. Setting aside the effects of sea water in neutralizing the virus, a half decomposed ox is not likely to be allowed to remain long enough above ground to do any harm; and as to the communication of the poison by the agency of the atmosphere, after having seen animals standing for months within less than a furlong of the dead and dying of cattle plague, without being affected, we are not likely to become converts to the atmospheric theory of infection. Nevertheless, it is important to effectually dispose of diseased carcases, and this can only be done when certain facilities are afforded for burial or for boiling them at a high temperature. Throwing animals overboard is admitted to be the least satisfactory way of getting rid of them permanently, but when they are not permitted to land, it is difficult to devise any other method.

Two years ago, when cattle plague was raging at Landermann, the authorities on one occasion found themselves with something like seven hundred carcases of cattle on their hands, with no means of burying them. Under these awkward circumstances, they hit upon the expedient of packing them in two old vessels, sending these out five and twenty leagues to sea and scuttling them. The ships did, it seems, what the lighters at Hull refused to do, sink; yet, notwithstanding the success of the scuttling and the distance from shore, some thirty of the carcases were washed up and stranded; but we

were not told that any fresh outbreaks of cattle plague occurred in the places where the dead cattle were thrown ashore. This is so far consolatory, and the more so, as it accords with our previous experience. There is no occasion to conceal from ourselves the fact that we are always incurring a certain amount of risk of the introduction of cattle plague; in short, all the restrictions which are placed on the foreign cattle trade are so many proofs of the existence of the danger. If all sections of the community held the same views, nothing would be more easy than to carry out the plan so often suggested of slaughtering all imported animals at the port of landing; but as there are more numerous and stronger interests in opposition to, than in favour of, the scheme, there is small chance of its ever being adopted. We must therefore be content to submit to an occasional outbreak of alarm like the one we have just passed through, and it is to some extent satisfactory to know that we are not the only people who are frightened at cattle plague.

Foreign nations within reach of the scourge are just now suffering a similar panic, and are being distrustful of each other. From Königsberg we hear that cattle of all kinds from Russia, and all animal products from that country, are prohibited. Denmark is alarmed, not only about Russian products, but, with better reason perhaps, about the cattle and substances which have been in contact with them nearer home.

Imports of German and Russian cattle into Denmark are strictly forbidden both by sea and land. The Schleswig frontier is watched, and the occurrence of a single case of plague in Schleswig-Holstein will be the signal for a military *cordon*. Cattle steamers from the Baltic are not allowed to communicate with the Danish shores.

The reason for this excess of caution seems to be the alarm that has been caused by telegrams from private persons announcing the intention of the English Government to refuse to land Danish cattle. Nothing, probably, could be further from the intention of the Government; but doubtless the telegrams were intended to serve some trade purpose, and very likely they succeeded in producing the desired effect.

Denmark, as an exporting country, is deeply concerned in maintaining a reputation for healthy stock, and we may trust to the authorities to adopt every possible precaution. We are not less concerned to preserve our stock in health; but we labour under the disadvantage of being an importing country instead of an exporting one, and wanting all the animal food which is likely to be sent us, we cannot adopt those sweeping measures of precaution which succeed in keeping out cattle diseases only by keeping out "cattle of all races" at the same time.

The arrival here, nevertheless, of cargo after cargo of infected animals in quick succession, at ports far distant from each other, is unprecedented in the history of the introduction of cattle plague into Great Britain. Within a fortnight, two cargoes came into London, two into Hartlepool, two into Newcastle, one into Leith, and one into Hull, in all 434 cattle—which were either diseased or had been exposed several days to the infection—besides many sheep which came with them. Thus, a heavy strain was suddenly put upon the machinery created by the Government, but fortunately it proved equal to the emergency. Had it failed in any essential particular, cattle plague would have been established once more among us. The escape we have had is a narrow one, for security depended not only on the quick detection of the disease, and the destruction of infecting material as centred in animals themselves, but in the disinfection, or otherwise dealing with matters, things, and persons, so as to prevent the *materies morbi* being carried to our cattle. After the experience we have had of the value of the present system of inspection, we may hope that the country will be somewhat less excited when the next cargo of plague-stricken animals arrives upon our coast.

THE CHOICE OF EXAMINERS.

It will be seen by reference to another part of our journal that our respected co-Editor, Mr. Fleming, has seen fit to relieve himself from the responsibility—if any—attaching to the sentiments which were expressed in our last month's Leader on the appointment of a member of the medical profession as an Examiner. Under the peculiar circumstances of the case, we feel it to be only due to our colleague that the *Veterinarian* should be placed at his disposal that he may give full expression to his sentiments, and, for the same reason, we insert, without complaint, his communication *in extenso*. It is necessary, however, to state that as Editors —apart from our colleague—we are quite content to bear any additional responsibility which may be thus cast upon us; for we believe that Mr. Fleming has viewed this matter from a stand-point which throws the deepest shade upon it—a darkness which, in truth, does not belong to it, but rather to the seer.

To drop metaphor, we unhesitatingly affirm that, for ourselves, we shall still labour to strengthen by every means in our power the union which happily exists between the several members of the two professions, and especially as Examiners of aspirants for veterinary honours. We fully admit that Surgeons—as Surgeons—are certainly not to be regarded as authorities on the diseases of the lower animals; but in advocating Physicians or Surgeons as Examiners on Anatomy and Physiology, we well know that we are selecting from a profession which can boast of possessing really efficient men. The great difficulty of the veterinary profession is that it has so little choice of Examiners from among experienced teachers; and we repeat—for the hundredth time—that unless a man is, or has been teacher, he makes as a rule but a very indifferent Examiner. Time, practice, and study have done much for those in office, and will, doubtless, do as much to remove difficulties and render other Veterinary Surgeons proficient as Examiners; but, after all, these things can never stand in the place of that daily

acquirement of knowledge, and daily imparting of it to others which the teacher has at command, and which so well fits him for being an Examiner. We entirely acquit our colleague, however, of any wish or intention to weaken the bond of unity and friendship existing between the human and veterinary practitioner; but we feel that such an undesirable result might follow, if wrong impressions are made on the mind of the profession, and if errors of judgment are allowed to pass unchallenged with regard to a section of the Court of Examiners being composed of scientific men who have a world-wide reputation, and yet forsooth are not Veterinary Surgeons.

In support of the broad principles here contended for, very much more might be said, but we refrain from such a discussion, fearing that we may soar too much aloft, or reach an ideal height far above the mental vision of some who were reared in the school of the "physiology of the horse," and "physiology of the ox, and other domesticated animals." Physiology of what? Ah! what indeed! Is it the "Blacksmith's physiology" of which we spoke? We confess that to our minds the expression is an absurdity, and we rejoice to know that its days are already numbered.

Rightly was it remarked by Dr. B. Sanderson, in his excellent address at the meeting of the British Association, that *physiology is a science* not necessarily belonging to the practice of medicine, although receiving support therefrom. To this we may add that medico-physiological examiners have often to search into the extent of the knowledge of the *science* possessed by him who is examined. They do not, and even ought not, to limit their inquiry into the *modus operandi* of the forces which maintain life itself, and how these are controlled by, yet ministered to, by brain matter and by blood; nor would they be justified in merely ascertaining from the examined the uses of certain organs of the body of man or animals, knowing something of which, many persons flatter themselves with the belief that they are profound physiologists.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

The Principles and Practice of Veterinary Surgery. By William Williams, M.R.C.V.S., F.R.S., &c., Principal and Professor of Veterinary Medicine and Surgery at the Edinburgh Veterinary College; Professor of Veterinary Surgery, and Examiner in Agriculture for the Highland and Agricultural Society of Scotland; and a Member of the Council of the Royal College of Veterinary Surgeons. Edinburgh: Maclachlan and Stewart; London: Simpkin, Marshall, and Co. 1872.

It has frequently been asserted, and not perhaps without some truth, that the teachers of veterinary medicine, as a whole, have contributed less to the enrichment of our professional literature than might have been expected. As helping to remove this reproach, if so be it exists, and as showing that teachers and teaching institutions are willing to make every effort to place themselves where they ought to be, in the front ranks of professional progress, Professor Williams has come to the rescue, and an examination of his work has satisfied us that he has not only not failed in the attempt, but has done much to promote the advancement of veterinary science.

The work is purely, or nearly purely surgical. The task which in his preface the author tells us he has attempted to accomplish, viz.—"To render a full, and at the same time concise exposition of the pathology of the diseases—more particularly of the surgical diseases—to which the domestic animals are subject, together with an account of the principles which ought to regulate their management and treatment"—has been executed in a manner calculated to impress us very favorably, not only with his scientific and professional abilities, but also, considering the somewhat exceptional circumstances in which he was for some time placed, with his energy and perseverance. Like the majority of treatises on systemic medicine and surgery, the earlier chapters are devoted to the consideration of the nature, varieties, symptoms, results, and treatment of that difficult and ever debateable subject of inflammation. In these several chapters ample justice is done to the varied and important phenomena attending this complex morbid action, and we

are put in possession of the latest views regarding the process as held by the most eminent investigators and experimentalists.

In regard to the nature and formation of pus-corpuscles, and their relation to those of mucus and epithelium, Professor Williams adopts the views enunciated by Virchow, "that these are not derived from any effusion, but that they are formed by vital changes in the germs of the tissues, and that by a slight modification of the same process new connective tissue is formed, that the pus-cells are the result of the proliferation of the connective and epithelial structures." In speaking of the results of inflammation, ulceration, and mortification, the distinctive differences between which are clearly but shortly given, we have a good account of the process by which sphacelated parts are removed from the system.

Having fairly described the leading features of *pyrexia* as attending the inflammatory process, and given a good digest of the arguments which have been employed to support both what is known as the *old* and the *new* methods of combating this perverted action, he says rightly enough:—"I must confess that I can neither assent to the views of the extreme antiphlogistics, nor to those of the writers who condemn bleeding altogether, being quite confident that I have seen many cases of inflammatory disease cut short by a *timely abstraction of blood.*"

The observations on fractures and diseases of the bones and articulations occupy eight chapters. In these there is much of a valuable nature, and not a little which is rather unique. All are enriched with the records of authenticated cases, collected with much care and patience, and registered with precision and minuteness. The chapter on non-inflammatory or degenerative diseases of bones is specially interesting. In speaking of one peculiar form of the diseases, he says, "Allied to rickets is what I may describe as true atrophy of the bones, mollities ossium, a remarkable case of which I have had the opportunity of seeing, and in which there was the removal of the earthy constituents of the cranial and facial bones, more especially at their borders, without any visible external alteration of structure. There was neither swelling nor abscesses; in fact, nothing to indicate the pathological change. In this case examination after death revealed softening, thinning, and perforation of the bones, giving them a pitted and worm-eaten appearance. . . . The palatine bones and alveolar processes were soft, porous, and spongy. . . . . The ethnoidal bone was completely absorbed."

Again, when speaking of fragilitas ossium he remarks, "The case related at page 170—the one we have just quoted —goes to prove that the two conditions are quite distinct in the horse, as in that case there was simply removal of the earthy constituents, rendering the bones flexible and easily cut with the knife. I contend that this is the true mollities ossium; whereas in the disease now under consideration fatty material is substituted for the cartilaginous basis, without removal of the earthy matter, and in this way the bones are rendered brittle, and liable to fracture from inappreciable causes." Professor Williams gives us what he considers as the distinctive differences existing between these several diseases, and from the number of cases he quotes he has succeeded in drawing the line of demarcation as distinctly, if not more so than most who have already attempted it; still, notwithstanding this, and the special attention which has been bestowed on these diseases by Solly, Curling, Stanley, MacIntyre, and Rokitansky, we think there is even yet good grounds for viewing the question of their several distinctive differences, and the relations which they bear to each other, as scarcely so well determined as could be desired.

The subject of lameness with diseases and injuries of the feet occupies ten chapters. Our professional records, which may be said to be wonderfully rich on these subjects, have been liberally drawn upon, the sources faithfully acknowledged, and the conclusions justly stated. Amongst the members of the profession we think there will be little difference of opinion as to the expediency of classing as unsoundness the various affections which in these several chapters receive attention. On the pathology of some, however, and notably that of navicular disease, we suspect the same cannot be affirmed.

In speaking of the subject of lameness, the following observations on the curative action of external irritants are deserving of attention:—"I am of opinion," he says, "that the curative action of external irritants is not due to their producing metastasis on counter-irritation, but that they excite within the originally diseased structure a reparative inflammation, partaking in its nature of what is described Virchow by as the secretory inflammation, which, superseding the original diseased process (whether that be inflammation pure and simple or its effects—ulceration, caries, or the formation of a low form of fibrous tissue), excites the formation of reparative material by which breeches are united, ulcers healed, and diseased action removed."

Of tumours, malignant and benign, we have an accurate

account on the basis and classification of Paget, showing pretty clearly that the most malignant in man, the cancerous, are comparatively rare in our patients.

Wounds, their classification, treatment, methods of repair and results, together with the diseases and injuries of the facial region, including those of the pharynx and œsophagus, receive a careful and minute description throughout.

On the somewhat difficult but interesting subjects of diseases of the eyes, of the arteries and blood-vessels generally, there is a good amount of special surgical knowledge, with a concise digest of all that is worth knowing, or rather, we ought to say, of all that is likely to be practically useful.

Following the consideration of hernia, diseases of the bladder, &c., is a chapter devoted to castration, which, properly enough, direct attention to those sanitary conditions needful to be attended to, so as to ensure an average amount of success. We are inclined to think—notwithstanding Mr. Williams's expressed confidence in the superiority and humanity of the method of operating by torsion—that, in deference to the opinions of others, modes even more extensively employed ought to have had more than a passing notice.

The latter chapters—from the thirty-seventh to the forty-first—are occupied with a dissertation on the diseases of the skin. Here Professor Williams has by a judicious elimination of many things, and a perspicuous description of those which are essential, rendered the subject intelligible to all who will give it only ordinary attention.

Distributed throughout the book, illustrative of the text, are four pages of photo-lithographs, and upwards of one hundred and thirty woodcuts. With few exceptions these are creditably executed, and, together with a copious and well arranged index, considerably enhance the value of the work.

From the examination which we have made of "*The Principles and Practice of Veterinary Surgery*" we have no hesitation in giving it our unqualified approval, and in regarding it as a most important addition to our professional literature. Eminently sound in its principles, the work will be found by the comparative pathologist both interesting, instructive, and suggestive; while by the student, as well as veterinary practitioner, it will be highly valued as a text-book, and as a work of reference.

Extracts from British and Foreign Journals.

ON THE DEVELOPMENT OF BILHARZIA HÆMATOBIA; TOGETHER WITH REMARKS ON THE OVA OF ANOTHER URINARY PARASITE (THE SO-CALLED TRICHINA CYSTICA OF DR. SALISBURY) OCCURRING IN A CASE OF HÆMATURIA FROM NATAL.*

By Professor T. Spencer Cobbold, M.D., F.R.S.,
Lecturer on Botany, Parasites, and Parasitic Diseases at the Royal Veterinary College.

In my recently published 'Lectures on Practical Helminthology,' I have recorded the case of a little girl whose parents sought my advice in the spring of 1870. She was suffering from the effects of an invasion by the African blood-fluke, a parasite now very generally recognised by the combined generic and specific title of *Bilharzia hæmatobia*.

As some misapprehension appears to exist on the subject, I may mention that I originally employed the generic title *Bilharzia* to designate a male specimen of the worm, which I found on the 4th of December, 1857, in the portal blood of a sooty monkey (*Cercopithecus fuliginosus*) that had died at the Zoological Society's Menagerie, Regent's Park.

It must be understood that the ordinary rules of zoological nomenclature rendered it imperative that the original title of *Distoma*, as applied to this entozoon by Bilharz and Griesinger, should not be allowed to remain. It was quite clear that its structural characters departed too strongly from those presented by the ordinary fluke-type to permit of its being zoologically associated with the Distomes properly so called; consequently, various helminthologists proposed new and more appropriate names. The late Dr. Carl Moritz Diesing of Vienna, Dr. D. F. Weinland of Frankfort, and Professor Moquin-Tandon of Paris, severally suggested the titles *Gynæcophorus*, *Thecosoma*, *Schistosoma*; but, when it was subsequently found that the title *Bilharzia* had been proposed by myself some six months before Diesing communicated his paper to

* Read before the Metropolitan Counties Branch, May 17th, 1872.

the Vienna Academy, the choice of several systematics and others fell upon my title, which had the additional advantage of handing down the true discoverer's name to posterity. In a letter which I received from Dr. Weinland (dated September 6th, 1861), that able helminthologist willingly abandoned the claims of *Schistosoma*, remarking that "the generic term *Bilharzia* has the preference." On the other hand, Professor Leuckart, disregarding the remarkable structural divergences which he has himself so fully described, is content with the old generic name of *Distoma* (or, rather, *Distomum*); but, if this view were adopted and retained, it would altogether upset our notions of group-equivalency, and virtually relegate to a genus the wider functions of a family or sub-order.

The professional interest attaching to this entozoon is so considerable, that I am constrained to correct some other errors and misrepresentations which have crept into the literature of the subject. It is well known—and I have myself been at some pains to recognise the fact, both in my larger treatises on *Entozoa* and in the article 'Helminthes,' contributed to Dr. Gunther's *Zoological Record* for the year 1865—that Dr. John Harley was the first physician who recognised the existence of the Bilharzia disease as occurring in Southern Africa. In other words, he proved to demonstration that this parasite was the true cause of the endemic hæmaturia of the Cape of Good Hope. This discovery constituted a positive advance in our knowledge of the causation of urinary disease; and it likewise contributed materially to enlarge our ideas respecting the geographical distribution of a truly remarkable entozoon.

In the original memoir by Dr. John Harley, it was not unnatural, perhaps, to find that the author regarded the parasite to which the Cape ova and embryos were referable as a distinct species, especially as he was then, as now, by his own confession, totally unacquainted with the adult entozoon. A similar misinterpretation occurred to myself in respect of the *Bilharzia* which I found in the monkey; but I soon afterwards abandoned the position, when Leuckart disputed the grounds on which the determinations were based, and sent me some adult Egyptian specimens to compare with my so-called *Bilharzia magna*. Dr. John Harley, however, seems very reluctant to acknowledge the specific identity of the North and South African fluke-hæmatozoa. Thus, in his recently published third communication to the Royal Medical and Chirurgical Society, he says:—"My position with regard to the question is pretty much the same

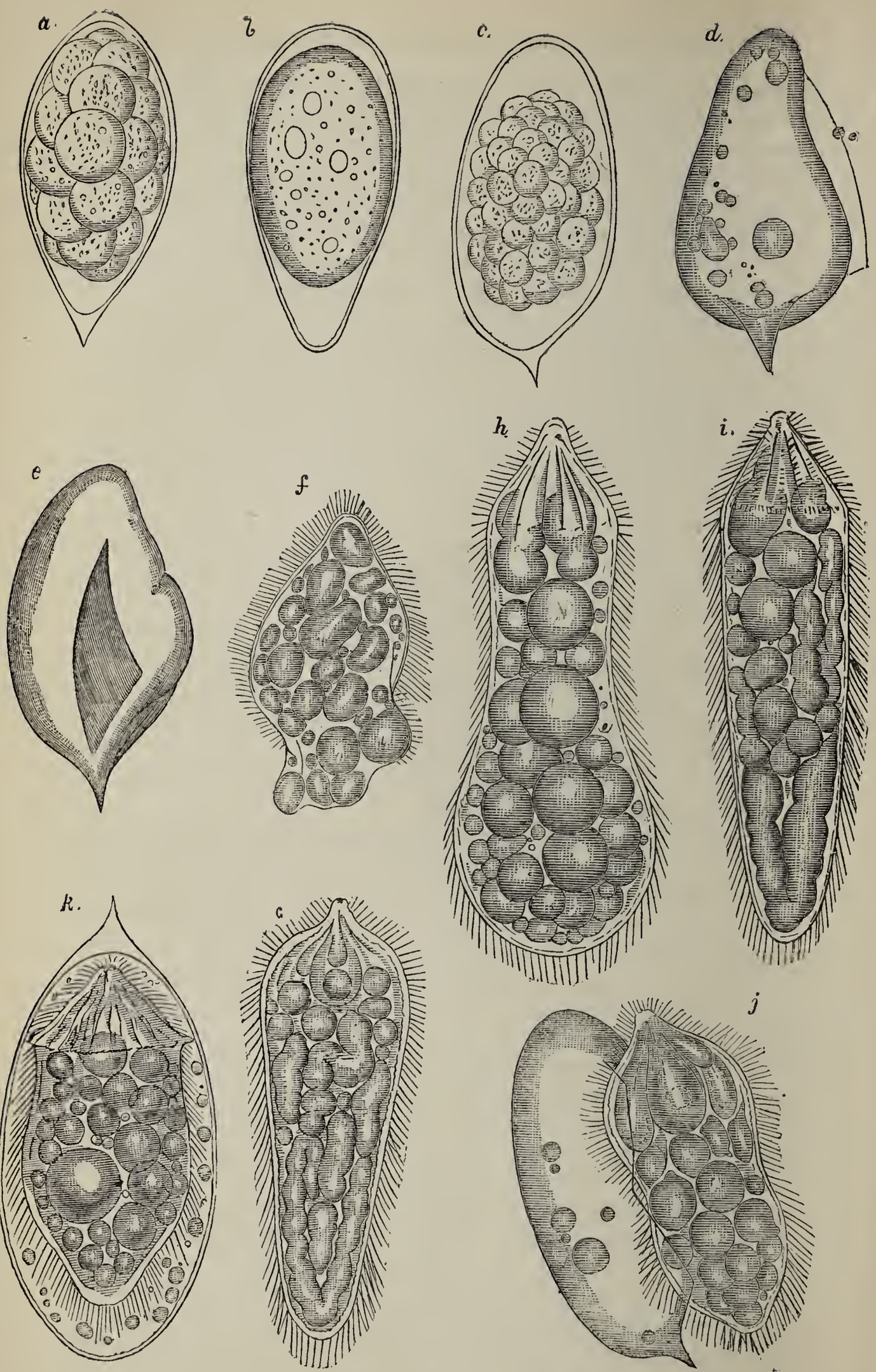
as it was seven years ago. The difficulty lies, on the one hand, in my cases, in the almost complete concealment of the adult parasite—for as yet I have only seen fragments of the animal; and, on the other, in the imperfection and insufficiency of the published figures of *Distomum hæmatobium*, together with the facts that both Bilharz and Griesinger describe and figure two forms of egg, the one with a terminal, and the other with a lateral spine. In all my own cases, I can say positively that only one form of egg has existed, namely, that with a terminal spine. Variation in the size, length, and outline of the egg is often observable; but I have never seen any egg with even a tendency to the formation of a side spine. I even doubt whether this peculiar form exists in *Distomum hæmatobium* itself. To my mind, the objects represented appear to be escaped embryo masses, and not eggs. Griesinger himself speaks of them as eggs or cocoons. If these two talented observers yielded this point of difference in the ova of the Egyptian parasite, then I grant that I find no difference between *Distomum hæmatobium* and *Bilharzia capensis*."

It thus appears that Dr. John Harley would establish specific differentiation on slight, or, at all events, on more or less well marked variations of egg-contour. Further on, I hope to be able to convince Dr. Harley that it is not necessary to refer this question to the *savans* above named; and I almost doubt if he has, for himself, carefully looked into their writings, or to the abridged account of them given by Leuckart. So far from there being no good figures of the adult worm, it has always appeared to myself that Leuckart's various representations are remarkably accurate and complete. In his first memoir, morever, Dr. Harley is singularly unhappy in his references to foreign authorities. Thus, in the *Transactions* for 1867, he says (page 62): "Bilharz and Griesinger, followed by Derseble [*sic*], Kückenmeister [*sic*], and Leuchart [*sic*], have described this parasite." Now, apart from the obvious misspelling of the names of Leuckart and Küchenmeister—a carelessness shared by some other writers—the word Derseble is introduced, and made to do duty for a separate substantive authority. This spurious title Derseble is a misrepresentation of the German pronoun *derselbe;* and, when the original reference is consulted, it will be seen that the pronoun (= *Idem*, or the same author) clearly refers to a second contribution by some previously quoted authority. The writer really quoted by Leuckart, whence Dr. Harley has borrowed his references (*Die Menschlichen Parasiten*, s. 617), is Bilharz, who had contributed a

second paper to the *Wiener Medicinische Wochenschrift*. It is thus quite evident that this paper by Bilharz—one of the two foreign authors justly characterised by Dr. Harley as "talented observers"—is attributed by him to an altogether independent writer having the name of Derseble, which, as I have explained, should have been written *derselbe*. In the interests of truth and accuracy, it is necessary to correct these serious mistakes; but I may remark that, if it had only occurred to some one or other of the learned "Fellows of the Society appointed by the Council as referees of papers" to have drawn the author's attention to them before going to press, the *Transactions* of the Royal Medical and Chirurgical Society would have deserved none the less credit for bringing out and doing full justice to Dr. Harley's otherwise useful and valuable contributions.

When fully developed, the eggs of *Bilharzia hæmatobia* are more or less oval, commonly measuring from $\frac{1}{180}''$ to $\frac{1}{100}''$ in length, with an average transverse diameter of $\frac{1}{325}''$. Some few are a trifle larger, whilst many others are much smaller. Occasionally one encounters remarkably narrow specimens, and also aberrant forms presenting a decidedly obovate or pear-shaped outline (Fig. *a*). I have met with eggs not exceeding $\frac{1}{250}''$ in their long diameter, and $\frac{1}{600}''$ transversely, whose yelk contents nevertheless had already arrived at an advanced stage of segmentation.

The shell is transparent, of a brown colour, and free from any markings, lines, or sculpturing. One pole of the shell is invariably narrower than the other, and usually presents a more or less pointed extremity. This narrow end commonly displays a sharp, projecting, beak-like spine (Fig. *a*, *c*, *d*, *j*, *k*). Very constantly the base of the spine rests upon the central point of the pole of the shell (Fig. *k*); but not unfrequently the process is eccentrically placed (Fig. *d*). In some few examples, the spine is removed to a little distance from the actual extremity of the shell; but even in these instances, so far as my observations go, its apex always projects beyond the level of the curved end of the pole. It is difficult to avoid the conclusion that the figures showing the markedly lateral disposition of the spine represented by Leuckart and Bilharz are not somewhat exaggerated; nevertheless, I have frequently witnessed an approach towards the extreme degree of side disposition which they describe. Sometimes the spine is altogether absent (Fig. *b*); and, when present, it is, as I have already hinted, very unequally developed. In size, it ranges from a mere point having an extreme length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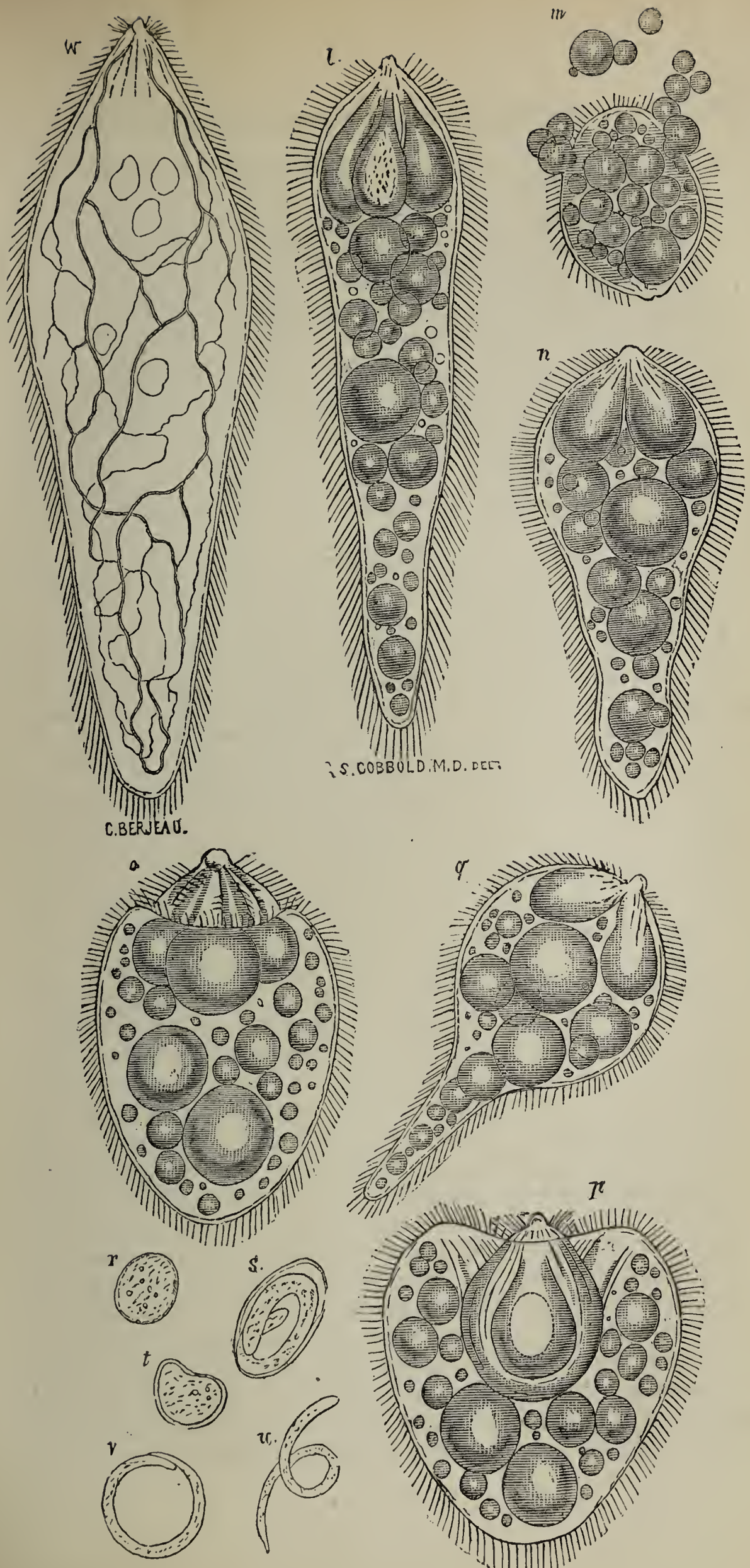
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of only $\frac{1}{800}''$, up to the comparatively large magnitude of $\frac{1}{250}''$ lengthways.

According to the evidences thus placed before us, in respect of the occasionally eccentric disposition of the spine, and considering also the possibility of the occurrence of more extreme departures than those which I have myself observed, I think that Dr. John Harley will have to admit that there is no good ground for asserting the probability of any specific differentiation between the adult parasites coming from the Cape and Egypt respectively. And here I may remark that, in determining delicate questions of this kind, the lessons gained by a prolonged study over the whole field of parasitology materially aid one iin arriving at the truth.

Taking a more extended view of the significance of these singular chorional outgrowths, I think it is possible to deduce conclusions of higher import than the particular one at which Dr. Harley appears to have arrived. I am not aware, indeed, that the ideas which I have for some time entertained on the subject have occurred to any other student of helminthology; but in these minute and frequently inconspicuous spines I clearly recognise the early efforts of Nature, so to speak, to form or evolve a special organ, which, in the eggs of certain other parasites, becomes capable of attaining a relatively prodigious degree of development. To me it seems that the little process in question is a kind of rudimentary holdfast; and, as such, it may be reckoned as the homologue of a variety of egg-appendages.

Eleven years ago, Mr. Edwin Canton discovered some curious ova attached to the conjunctiva of a turtle's eye; and when he afterwards submitted specimens to my scrutiny, I had no hesitation in pronouncing them to be referable to some particular species of ectozoon or entozoon belonging to one or other of the allied genera *Polystoma*, *Tristoma*, *Octobothrium*, and *Dactylogyrus*. Now, it is particularly noteworthy, that these several genera belong to the same great group of flukes or trematodes as the *Bilharzia;* but whereas, in the case of the African human blood-fluke, the ova display only a solitary and imperfectly developed holdfast, placed at one end of the shell, the singular eggs described by Mr. Canton are found to develope organs of anchorage at both extremities. I may remark, morever, as I also mentioned at the time, that parasitic ova exhibiting analogous processes, spines, and filamentary appendages at both poles, had already been observed by helminthologists in various species of parasite—as, for example, in *Monostoma verrucosum* infesting the fox, in

Tænia cyathiformis infesting the swallow, in *Tænia variabilis* of the gambet, in *Octobothrium lanceolatum* attached to the gills of the common herring, and in *Polystoma appendiculata* from the branchiæ of various marine fishes. Characteristic examples of the eggs of parasites which, like *Bilharzia*, are furnished with a singular appendage, may likewise be seen in the ova of different species of *Dactylogyrus* infesting the gills of the pike, and also in the eggs of *Diplozoon paradoxum*, where, moreover, the variations of the degree of development of the holdfast are much more striking than anything we have seen in the eggs of *Bilharzia hæmatobia*. In the more strongly pronounced developments it is easy to perceive how admirably adapted are these outgrowths of the egg for the various necessities of the different species of parasite to which they are severally referable; and, even in the case of *Bilharzia*, the trifling amount of anchorage furnished by a projecting point is not absolutely thrown away. The resistance will also be greater where the spine is situated a little on one side of the pole of the egg, which in many instances seems to need steadying during the violent struggles of the embryo to escape from its temporary abode.

When any considerable number of ova are removed from the urine and examined together, it will be found that a large proportion of them contain embryos in a more or less advanced stage of larval growth. The structural appearances presented by the embryos whilst still in the egg are remarkably uniform; since, in all, the yelk appears to have resolved itself into a mass of rounded or oval sarcode-globules, one or two of these particles being conspicuously larger than the rest (Figs. *h*, *k*, *o*). At this stage, except at the cephalic division of the lava, no tendency to differentiation of the sarcodic contents is perceptible; but, some time after the embryo has escaped, one may notice elongated masses of sarcode formed by the coalescence of the globules. Whilst still in the egg, one end of the primitive embryonal mass becomes gradually narrowed, cilia at the same time making their appearance. This part becomes the future head, which eventually acquires a distinctly conical figure. Whatever form the body of the embryo may display after extrusion from the shell, the head retains its conical shape; the cone itself being narrowed or widened, as the case may be, only when the larva is subjected to abnormal conditions (Fig. *m*, *n*, *q*). Whilst the head is undergoing its development within the shell, one, two, or sometimes three, pyriform masses make their appearance within the cone; and after the embryo has escaped the shell, these structures become more marked, being at all

times readily distinguishable from the ordinary sarcodic elements of the body properly so called (Fig. *g*). The sarcode-globules refract light strongly; and, when the larva is not compressed in any way, they move freely within the somatic cavity. In well developed embryos, whilst still in the egg, the cilia are observed to clothe every part of the larva except the oral papilla. This minute nipple-like projection measures about the 1-3000th of an inch transversely, forming a very simple kind of unarmed proboscis. When the head of the free embryo is viewed from above, the proboscis looks like a central ring surrounded by a series of regular folds, which radiates outwards like the spokes of a wheel. The ridges thus formed support numerous cilia; these latter projecting at the circumferential margin of the cephalic cone in such a way as to present the figure of a star. Dr. Harley has given an admirable representation of this character, which is shared by many other parasitic larvæ. Throughout the greater part of the time, whilst the embryo is still resident within the egg, the broad neck or base of the cephalic cone forms a fixed point of resistance by its firm attachment to the inner wall of the shell; and this structural union, so long as it remains intact, enables the embryo to move not only its head and body from side to side synchronously, but also each part quite independently. When the time for final escape is drawing near, the vigorous movements of the cone-shaped head seem chiefly concerned in loosening the membranous connection just referred to; and when, at length, the ciliated animalcule has succeeded in overcoming this first difficulty, it is almost ludicrous to witness its frantic efforts to find an opening in the shell. While thus partially liberated, it will rush to and fro from one pole of the egg to the other, performing a series of summersaults, and at the same time occasionally rolling itself over laterally. This activity becomes gradually more and more violent, until at length its apparent excitement seems to be worked up into a sort of frenzy. I have many times watched these remarkable performances, which, however, are only to be seen within those ova whose shells, for some reason or other, refuse to yield to the earlier and ordinary efforts of the prisoner. In all cases where these remarkable phenomena are witnessed, the eye readily detects a number of small free globules between the embryo and the inner wall of the shell (Fig. *k*). These minute particles are likewise tossed about tumultuously during the rapid rotatory movements of the imprisoned larva. Except as regards their size, these globules do not differ in character from the sarcodic contents of the animal-

cule. They are probably superfluous detachments from the primitive yelk-mass; but it is just possible that they may afford some aid in the final breaking up of the shell. Whilst the embryo remains fixed, its tail is usually directed towards the narrower or spine-bearing pole of the egg; but in a few instances I have seen this position reversed. In some excellent figures of the ova of *Bilharzia* sent to me by Mr. Pilcher, I find the same variations of position faithfully depicted. Under high magnifying powers, whilst the embryo lies perfectly quiescent, the hundreds of points at which the rigid cilia of the body impinge upon the inner wall of the shell collectively present, when viewed from above, a regular series of highly refracting specks. These minute specks or dots, in certain arrangements of the focus, have the aspect of so many rings, and suggest the notion of a finely sculptured surface, such as we see normally in the eggs of certain other parasites. The escape of the embryo, however, enables one to detect the purely optical character of the phenomenon, which is due to diffraction.

As regards the precise mode of emerging from the shell, and the time occupied by the larva in freeing itself, there are some other points of interest. Speaking generally, it may be said that, the purer the new medium into which the ova are transferred, whether accidentally or otherwise, the more rapid and perfect will be their movements and escape. To give an example of observed facts in relation to the rapidity of development, I may cite the following from my notebook. "On the 20th of August, 1870, I placed twelve eggs of *Bilharzia* under the field of the microscope. The medium in which they were immersed consisted of about eight parts of ordinary drinking water to one of urine. At the expiration of seventeen minutes, the first-born, so to speak, made its escape. In the course of another minute, two more emerged. In twenty-six minutes the fourth, in twenty-eight minutes the fifth, in thirty-two the sixth, in thirty-four the seventh, in thirty-seven the eighth, in thirty-eighth the ninth, in forty the tenth, in forty-three the eleventh, and in forty-six minutes the twelfth, respectively made their appearance."

Now this rapid mode of birth or emergence from the shell is very much more striking in the case of eggs which are placed in perfect pure water; for, whilst the eggs are still in the urine, there appears to be neither the power nor the inclination on the part of the embryo to escape; but, on isolating and placing them in more suitable conditions, their behaviour is even more remarkable. In a space of less

than two minutes, I have repeatedly seen the hitherto motionless embryo alter its shape by contractions, become violently agitated, and burst out of its shell in the condition of a free swimming animalcule. Moreover (as I have elsewhere observed in relation to the general question of the dispersion and vitality of the germs of entozoa), it is worthy of remark that the eggs and larvæ of *Bilharzia* soon perish in stale urine. "On the 16th of August, 1870, I placed about a thousand eggs in a quart of fountain-water, to which only a drachm or rather less of urine had been added. At the expiration of forty-eight hours, not a single living embryo could be found. In fact, I subsequently ascertained that I could not keep the embryos alive for twenty-four hours in any water in which I had accidentally or otherwise introduced the smallest trace of mucus, blood-corpuscles, urinary crystals, or decomposing matters of any kind. All sorts of reagents speedily killed the larvæ. Mere discoloration by carmine-solution, or by the addition of a drop of the permanganate of potash in the form of Condy's fluid, instantly caused them to assume grotesque and unnatural shapes (Figs. *n*, *q*); death sooner or later following, as a result of the disintegration and resolution of their delicate bodies into minute sarcode-masses (Fig. *m*). Still more rapidly poisonous effects were produced by the addition of a little sherry or alcohol, even in solutions where the amount of spirit did not exceed one part of the latter, proof strength, to fifty parts of water."—*British Medical Journal.*

(*To be continued.*)

BRITISH ASSOCIATION.—MEETING AT BRIGHTON.

ANATOMY AND PHYSIOLOGY.

President—Professor Burdon Sanderson.

In opening his address, Mr. B. Sanderson said—"I should have been glad if it had been possible to have occupied the time in giving you a retrospective account of the progress of physiological research during the past year. I had intended to do so, but was led to abandon my intention on the ground that, although the work done has not been inconsiderable, we in England have taken very little part in it. If I had attempted the task, I should have been but chronicling the

achievements of our friends in Germany, who are now holding their own scientific assembly at Leipsic. I find it more agreeable and more encouraging to look forwards than to look back, for although we English physiologists must admit with regret that we have had very little to do with the unprecedented development of our science during the last two decades, we do not intend to continue in the same inactive condition in future. Considering that the purpose of our meeting in this room is to promote the progress of physiology, I do not think I can more properly occupy your time than in endeavouring to show in what direction efforts must be made to improve its position, and particularly to secure a future more fruitful of substantial results than the past has been. I shall begin by asserting a general principle, which as I go on I shall endeavour to justify—that the reason why physiological research is less successfully pursued in England than we could wish it to be, lies in the general want of scientific education. In illustration of this position, I shall refer first to that higher training which is required for the production of scientific workers or investigators; secondly, to what may be called the education of public opinion by the popularising agency of books and lectures; and, lastly, to the introduction of natural science as an element of education in our great schools and universities.

"If a man wants to be a physiologist, he must, as things at present stand, study medicine. There is no logical reason for this; for although medicine ought to be built on physiology, there is no reason why a physiologist should know anything about the art of curing diseases. Practically, however, it is the case, that the kind of education which a man requires in order to be a physiologist is best obtained through a course of medical study. I confess myself to be of the opinion that this close relation between medicine and physiology is likely to be a permanent one, on the general ground that any science is likely to be studied with more earnestness by those who have to practise an art founded upon it than by others. For example, in England, there can be little doubt that it is to our pre-eminence over all countries in the mechanical arts that our having greater men in the physical sciences on which these arts are built is due. The reason why the same sort of beneficial reaction of art upon science has not manifested itself in our own sphere is, that the connection between the two—that is, between physiology and medicine—is much less substantial. We physiologists are not yet in a position to advise the doctors, and they, resting on the more reliable teaching of experience, are quite

willing to do without us. If I am right in supposing that the pursuit of physiological research will always be closely connected with medical study, it becomes of interest to us to know in how far the existing institutions for teaching are fitted for the training of scientific men. We who are personally concerned in the teaching of medicine must admit that, so far as concerns English schools, an ordinary medical education is a very poor preparation for a scientific career. The reason of this is that the "medical sciences," as they used to be called—viz. chemistry, anatomy, and physiology —have developed far too fast for the resources of the medical schools. Physiology, which twenty or thirty years ago might be called the handmaid of medicine, has become a science quite independent of the art which first brought her into existence—learning little or nothing from it, based entirely on experiment, and claiming much closer relationship with the other experimental sciences. Twenty years ago a lecture room and a gallery for showing preparations under the microscope was all that was thought necessary even in the largest and best appointed of our schools of medicine, but then how different was that time from the present? Ludwig had lately written his earliest papers on arterial pressure, and had thus, by the introduction of new methods, inaugurated a new era in the physiology of the new mechanical functions. Du Bois Reymond had scarcely begun that series of researches by which he, like Ludwig, might be said rather to have founded a new science than to have extended the limits of an old one. In France, Brown-Séquard had made his great discovery of the functions of the vasomotor system, and Bernard his of the glycogenic functions of the liver. All of these being the results of which the intrinsic value, great as it was, has been surpassed by the influence they have since exercised on the progress of that science. How rapid that progress has been may be judged of by any one who chooses to read any of the text books of twenty years ago in the light of recent researches. In this great progress we should rather not have to admit that Germany has done so much of the work; France, notwithstanding her great leaders, has done less than she ought to have done. In taking her part in it, England has been represented by us, her medical teachers, but we, confessing ourselves to be possessed neither of the men nor the means of prosecuting an experimental science, have been only too readily content to reap the fruits of other men's labours. It would not be agreeable to make this admission, were it not possible to look forward with considerable confidence to something better. In the great schools of London, in the old univer-

sities, and in one or two of the provincial schools, great efforts are being made to provide adequate buildings and appliances for the experimental teaching and study of physiology. It is, I think, a most encouraging sign of the times that, in this progressive movement, the initiative has been taken by Trinity College, Cambridge. That wealthy corporation, the name of which brings to our recollection the intellectual glories of our country, has provided for physiologists a place for study and labour, from which (short though the time is for which it has existed) three valuable researches have already sprung. To what the University of London has done within the past twelve months in establishing a laboratory for inquiries in one branch of physiology, that which relates to the origin and nature of disease, it is scarcely possible for me to refer, excepting so far as to express my hope that its influence will eventually be felt in strengthening the hold of physiology on practical medicine. Notwithstanding all these efforts, it will take years for us to regain the position we ought to maintain. The appliances and places for work have been obtained, and this is a great step forwards. But we still want the pecuniary resources which are necessary for the carrying out of systematic and continuous researches, and above all, we have still to educate workers. Of the two wants I have mentioned, the want of money and the want of workers, the latter is the most important. The difficulties which lie in our way in this respect are very great indeed. The obvious difficulty—the objection, I mean—which is always advanced by young men as a reason for not giving up their time to scientific research is, that it does not pay. But it need scarcely be said that the real difficulty is a more general one. It lies in the practical tendency of the national mind, which leads us Englishmen to underrate or depreciate any kind of knowledge which does not minister directly to personal comfort or advantage—a tendency which was embodied in the philosophy of Bacon, and has been thought by some to constitute its weakness. I have no doubt there are many in England who would not be deterred by the prospect of comparative poverty, which in every country must be the part of those who devote themselves to abstract science, but very few who have the courage and resolution to follow this course in spite of a public opinion which estimates science on utilitarian principles. This leads me naturally to my second point, which is, that the most efficient means we can take to improve the position of our science in England are those which have for their object the enlightenment of public opinion, and that this is to be effected partly by diffusing in-

formation about our labours among the public, and so inducing a greater interest in them, partly by introducing training in physical science into our schools. In the art of exposition, that is of making difficult subjects plain, we have among us (not with us to-day, I am sorry to say), one who is a master whose powers have been acknowledged not only in England but in France, and still more emphatically in Germany. His work on Elementary Physiology has been translated and presented to the German public by one of the leading German physiologists, himself a model of clearness of style—who tells his countrymen in his preface that no German writer could expound the experimental facts which are the basis of physiological knowledge, as Huxley can. In the existence of such a man as Huxley I find a great source of encouragement for the future of physiology—not only on account of his own work, large though that has been (for no one builder can lay many bricks in an edifice where every brick requires such careful laying) as for his influence on the national life. At one time I confess that I was disposed to underrate the value of popularising science. Now I see this power of exposition to be a great power for good. We have an example of the good that it affects in the history of this Association. We have another in the history of the Royal Institution, which has lately been made familiar to us by the accounts which have been given to us of that great and good man, who for so many years was its life. Faraday, the greatest physicist of his time, was equally master of the art of exposition. Of the influence which his mind thereon exercised on the minds of the men, women, and children, who can doubt; nor do I think that he lost by it himself, for although we cannot suppose that he taught without some exhaustion of his energies, I cannot believe that the effort was a useless one even to himself. I would not venture to say of such a man that, in explaining to children the fundamental conceptions which in his mind were already so clear, they became still clearer, but I think that it may be so. I pass at once to the second part of my position, that which relates to the teaching of science, and particularly physiology, in schools. This I may deal with very shortly. The teaching must necessarily be elementary. If it is thorough and genuine it is useful. To wedge a little bit of Bowdlerized physiology, "something about the structure and functions of the human body," as it is called, into the ordinary course of school education, may be an ornamental addition to it, but can scarcely be really useful as intellectual training. Our reform of education must, if it is to be attempted at all, be much

more complete and radical. It must consist, not in adding natural science to the system of instruction in which we ourselves and our predecessors were brought up, but in substituting for some of the old drudgeries something better and more substantial. As regards that higher education which may be defined as introductory to the studies of the university, most people are now disposed to recognise that there exists at the present day a tendency to increase its extent at the expense of its thoroughness. On the one hand a powerful effort is being made by the *laudatores temporis acti* to maintain the old disciplines, while on the other, a general, though somewhat vague notion, prevailed that no system of education shall be regarded as complete from which science is excluded. To reconcile these antagonistic tendencies the only method found has been that of addition and accumulation. Instead of displacing some of the old requirements, an additional load of new subjects has been imposed on the unfortunate examinee in the form of chemistry, physics, animal philosophy, &c. No wonder that, to the victim who has just passed through one of our modern ordeals, the very names of these sciences are sickening; for, in addition to the disagreeable task of getting them up from text books (text books, however excellent, are at best but very poor reading), the competitor, whether successful or not, has the consoling reflection that he has been doing treadmill work after all, learning a number of facts and laws of great value to the man who is able to possess himself of them, but to him rendered absolutely useless by the mode of study to which the present system of examinations has compelled him. The way to obviate this I have already hinted at. Let it be clearly understood, that if natural science is to be made a part of our educational system, it must be introduced, not as an ornamental addition or accomplishment, but as part of the groundwork. To serve as a groundwork, we must admit that physiology is obviously not suitable. The corner stone must, of course, be mathematics. Side by side mathematics the subjects which ought to claim preference are physics and chemistry, and this for several reasons. The first is that, while chemistry is an indispensable preparation for the acquirement of the other allied sciences, it can itself be taught and understood independently; a second reason is, that the appliances required for teaching it may be easily obtained, and the modes of demonstration such that it can be taught thoroughly and efficiently, not from books, of course, but in the laboratory. The third, and most important reason, is that the study itself is fitted in a remarkable degree to serve

as a mental discipline, and particularly as a means of developing at an early period of life that certainty, that convincedness of mind, that clear realisation of facts seen not by the bodily, but by the intellectual eye, which constitutes the scientific spirit. A boy who has once learnt to feel the certainty of the laws of molecular action, so long as he retains his mental soundness, cannot relapse into that state of vague indifference about facts which characterise many uneducated persons, or lose the habit of exactitude of conception and statement to which he is compelled by practice in chemical reasoning. It is clear that physiology could not be recommended on the same ground, yet I believe that they may be wisely included in ordinary instruction, not as a discipline or mental drill, but simply on the ground that it is so usefully applicable to the common affairs of life. It is, undoubtedly, well that every one should know something of the structure and functions of his own body, and this for several reasons: first, because he is enabled thereby to take better care of himself, and to understand how to preserve himself by reasonable precautions against some of the well-recognised causes of disease. Another reason is, that he is not so likely, as he would otherwise, to become the dupe of the many quackeries which are afloat. He would be more ready to take the advice of his doctor as regards the regulation of his mode of life, less credulous as to the efficacy of drugs. Let us now, in conclusion, state a little more precisely what influence the general adoption of a system based on scientific training would exercise on the progress of the science in which we are interested. I can illustrate this by taking the medical student as an example. We teachers of physiology to medical students know that, when we begin first to talk to them about the principles of the subject—*e. g.* about chemical change as the essential condition of vital phenomena; about the sources of animal heat and the relation between the production of heat and of external motion or any similar subject—the great difficulty is, that our auditors are utterly at fault for want of those fundamental conceptions about matter and its powers, which are expressed in the commonest words, such, for example, as solid and liquid, gas and vapour, weight, density, volume, &c., all of which to the average finished schoolboy are perfectly meaningless. The result is that these fundamental conceptions, not having been mastered at first, are not mastered at all, and the student begins to build the superstructure without having had the opportunity of laying the foundation; and thus the whole of the scientific

part of his education disappears out of his mind as soon as he enters on the more practical part of his studies. If the previous training were different it would not only make him a better student, but retain its influence on his mind through life. The details might fade away from his recollection, but the scientific habitude of mind would be retained. I trust that it will not appear to the members of the section that I have, in any of the observations I have made, forgotten that we are assembled here for the promotion of the science of anatomy and physiology. Although I cannot claim a more direct interest on scientific education than for others, there are reasons, as I have endeavoured to show, why it suffers more from the want of it than others, the chief one being that, compared with what we physiologists feel and know to be its real importance to the future welfare of the human race, its practical utility is little appreciated because little understood by others.

"I have said very little indeed (indeed, I have barely referred to it) on another pressing difficulty, which we have now and will have, I believe, for years to encounter—the want of pecuniary resources—because I know that, in this country, if educated public opinion can be interested in behalf of any scientific object, and particularly if the intelligent classes of the community can be induced to see that the furtherance of abstract science is of vital importance to our national existence, the trifling public expenditure which would be required to enable us to compete, at least on equal terms, with Germany, Austria, Bavaria, and Russia, would be at once forthcoming. In the mean time it is the function and duty of all who, possessing means, are also interested in scientifie progress, as especially of us, the members of this section of the British Association, to afford such aid as we can to those who, supported by their own enthusiasm, rather than by the prospect of honour or emolument, are willing to devote their lives to physiological and anatomical researches."

OBSTETRICAL SOCIETY OF EDINBURGH.

REMARKS ON PARTURITION IN ANIMALS.

By Dr. Matthews Duncan.

I.—*Interval between Births in Pluriparous Animals.*

The advantages for human pathology to be derived from the study of comparative physiology and pathology are undoubtedly very great, yet, probably, not at present sufficiently

appreciated. The point which is now under consideration is one which does not, at least at first sight, offer much hope of realizing such advantage, but is worth while at least to collect and collate facts regarding it. Woman may be expected to differ widely from animals that are naturally or ordinarily pluriparous, because she is not naturally or ordinarily pluriparous. With her, pluriparity is an abnormity or disease whose injurious influence is easily traced in the disordered health or mortality of both mothers and children. Pluriparity in her is, to a great extent, an indication of immaturity or of decay of the generative power and function. In the pluriparous lower animals which we know best, it is the reverse. In them uniparity is the corresponding condition. These circumstances appear to indicate some great difference in the laws of the growth and decay of the reproductive function in uniparous woman and pluriparous animals; but I believe they really do not. In both cases, though in different ways, the imperfection of the reproductive functions and organs is displayed, as may perhaps be demonstrated by more complete evidence of a kind already adduced from the condition of the mothers and the offspring. Besides the considerations just mentioned, there is a great difference between woman and pluriparous lower animals in the thickness and power, and probably also in the irritability of the gravid uterus.

In woman, it is well known that twins are born quickly after one another, the interval generally not exceeding a few minutes, very rarely a few hours, unless, indeed, there is difficulty or impossibility of spontaneous parturition, when the delay is easily accounted for, and not by any failure of appearance of the parturient energy. It is common to find delays of days described as taking place between the spontaneous births of mature twins, but I have never in my own practice met with such, and I am disposed to suppose some mistake in regard to such cases, to explain them in some other simple way if possible, and to join with those authors who go the length of at least expressing doubt as to any such occurrence ever taking place. The case of longest delay which I have seen was a remarkable one, in which I was consulted some time ago. The interval was three days. But it was not between spontaneous births. The second child was delivered by turning, and podalic extraction performed in as difficult circumstances as I ever encountered. This is not the place to describe this interesting case; suffice it at present to say, that the practitioners in attendance thought that the membranes of the second fœtal bag were unruptured,

and also that delay in delivering was not contra-indicated. The supposed bag of membranes was a sort of spurious caput succedaneum formed on the side of the chest of the second child. The mother recovered.

I am indebted to Dr. Wilson for the following note of a case of long interval between births of successive kittens:

"I send you a few short notes upon a case of kitten-birth which occurred lately in my house in Tweedmouth. They may, perhaps, be useful to you. The cat was in her second pregnancy. One morning I was informed by the servant that a dead kitten and the head of a second had been found in a basket filled with soiled clothes. Upon examination, I found such to be the state of matters, and had them removed; but the appearance of puss led me to suspect that another kitten was still *in utero*, and accordingly I gave strict orders that the cat should be carefully watched, and allowed free access to the lying-in chamber and basket. At the same time I was informed by the servant, that the day before the birth she had accidentally put her foot upon the animal, thus probably causing premature labour. *Twelve* days afterwards the birth of the third kitten was announced to me. It was perfectly strong and healthy, and was brought up in the house. I mentioned that one kitten and the head of a second was found—was the body eaten in place of the placenta?"

It is not certain, in this place, whether the first birth was a miscarriage, but it appears probable that it was so, and the result of injury.

The following note of a case has been given me by another medical friend. It is very like that of Dr. Wilson:

"On 16th March, at 7 a.m., a great noise of cats fighting was heard in the wash-house, and our cat fell into a tub of water. That night she gave birth to two kittens, one of them dead and the other small and feeble. It died next day.

"On 24th March she had another kitten of nearly the usual size. It was either born dead or died very soon. During the intervening days the cat seemed uncomfortable."

Dr. Bell considered it a new doctrine to describe twins as the result of disease, and could not agree with it at all. With regard to the time that a second child is retained after the first is expelled, he thought that three days is less than is often seen. He mentioned two cases of retarded birth of the second twin.

Dr. Keiller said that the views expounded by Dr. Duncan in regard to plural births occurring in the human subject might probably, in the main, be correct; but it seemed out

of the way, and not in accordance with ordinary practice or fact, to hold so strongly as Dr. Duncan apparently did, that such cases were morbid, and ought to be considered as a diseased state. There was abundant evidence to the contrary in the rude health of the parent and offspring in plural cases, which unquestionably were most frequently noticed in multiparous mothers. Notwithstanding Dr. Duncan's doubts as to their hereditary character, such might, he thought, be fairly assumed, on the best of all grounds, that of common observation in regard to the transmission of twins in certain families. Dr. Keiller then cited his observations on the mode in which kittens are born, and the ordinary interval between their births, and referred to experiments he had performed in cutting the cord close to the umbilicus of the kitten immediately on its expulsion. He proposed making these observations and experiments the subject of a special paper. Although plural kittens, like plural children, usually followed each other in quick succession, a more or less prolonged interval between their births occasionally occurred. He mentioned cases in which several days had been noticed to intervene.

Dr. Thompson could not agree with the doctrine that twins were an abnormality. He had seen several robust women with twins and triplets. He had lately attended a lady who had twins—she herself being a triplet. If there is a delay of twenty-four hours between the births of the twins, he believed that the second child will be stillborn. Still, he granted that the majority of women who have twins are delicate. He believed that twinning is hereditary.

In reference to the long interval that sometimes exists between the birth of twins, *Dr. Macdonald* mentioned a case that had occurred in the practice of one of the students at the New Town Dispensary, where he (Dr. Macdonald) had to apply forceps to deliver the woman of her second twin five days after the birth of the first; the patient died from post-partum hæmorrhage.

Dr. Cairns stated that he once gave a cat, when it was in labour, a drachm of ergot, and in less than two hours four kittens were born.

Dr. Burns supported the idea as to twinning being hereditary; he knew a woman who was a twin, she herself had twins four times, and her mother had had them three times.

Dr. Matthews Duncan, in reply, thought the cases mentioned were interesting and important, but that they did not bear upon the subject he introduced—they were not the spontaneous births of mature children, but were all excep-

tional cases. The experience of the last hundred years has not shown that there is any marked delay between the births of mature twins. Pluriparity he believed to be hereditary, so far as all diseases or morbid conditions are hereditary, but we have no positive proof of it. He understood that twins were not the result of disease, as Dr. Bell seemed to imagine he did, but that the fact of having twins constituted the disease.

II.—*Mummified Premature Calf expelled long after its Death in Utero—Missed Labour.*

It is well known with what extreme care fine black cattle are nowadays tended. From this cause, and from other circumstances which need not be mentioned, details of their cases are more easily and more certainly ascertained than those of women. The quey, from which this mummified calf was discharged, was a famous animal, and belonged to a celebrated herd of polled Angus. She was a winner of prizes, and was considered by her owner so fine as to be destined to propagate the famous qualities of the herd. On 8th July, 1865, she was inseminated by a still more famous bull. Pregnancy went on as usual for a time, but in December she was taken with the dreaded epidemic of rinderpest, and no doubt at this time the fœtal calf died. The herd was nearly extirpated by the pestilence, but this young cow made good its recovery. No calf made its appearance, nor any signs of labour at the time of the fœtal death, nor at the term of ordinary pregnancy. The fine heifer, if not in disgrace, had at least disappointed the hopes of her admirers. An order was issued to feed her for the butcher, and she formed a magnificent and much-admired specimen of a mart. But on 18th October, 1867, in the course of the extreme fattening which she underwent, the almost forgotten pregnancy was recalled to mind. The mummified calf here exhibited was expelled, and I understand without any effort, such as is seen in ordinary parturition, two years and three and a half months after insemination. It is natural, and probably correct to suppose that the expulsion was the mechanical result of the accumulation of fat in the omentum or thereabout; that the calf was displaced and squeezed out by the accumulating adipose matter.

The case just narrated is an example of death and mummification of a premature calf. Abortion did not follow the death of the fœtus, as in the ordinary course of events. Nor did air or germs get admission to the calf, and lead to

putrefaction; it became mummified. The exclusion of air was probably owing to the membranes not being ruptured. All these events and conditions are not unfrequent in the human female, except the very tardy expulsion of the lithopædion. I have seen many instances of the retention of the whole or part of an early abortion for a very long time, even beyond the full term of the pregnancy, had it gone on all right; but I have not seen the retention of what could be called a lithopædion, in an uniparous pregnancy, beyond what would have been the full term. The ordinary course is for the fœtus to die, the liquor amnii to become absorbed, the wound to diminish in bulk, and the mass to be expelled at or before what would have been the full term of pregnancy. The fœtus when so expelled has a peculiar appearance, and is rolled up, parcel-like, in the placenta and membranes.

Lithopædion, or a more or less perfect fœtus papyraceus, is not very rarely observed in pluriparous pregnancy, generally as one of twins. Here the fœtus dies in some early month, and remains in utero, to be expelled along with its surviving co-twin, or within a few days after it.

In all of these cases of lithopædion there is missed labour, or rather missed abortion or miscarriage. Conditions that, in the immense majority of cases, induce abortion or miscarriage, fail to do so in these remarkable instances. But there are two points in which the cow appears to differ in a marked way from woman; for, first, in the cow, the labour may be, and is often, missed, not only at or near the time of the fœtal death, but also at what would be the full term. This is, at least, a much rarer occurrence in woman, the lithopædion in her being generally, and as far my own experience goes always, expelled at latest when the full term of pregnancy is reached. Secondly, in the cow, an event not very rarely happens which I have never witnessed in woman, but which has been described as having occurred in her; namely, not the formation of a mummy premature fœtus or of a lithopædion, but putrefaction of the premature fœtus, and slow discharge of the products of the putrefying mass, without labour-pains being induced.

We have already said that in all these cases there is missed labour; but that term may be specially applied exclusively to those cases where the fœtus dies at the full term of pregnancy, or after it has passed, after the already mature fœtus has waited weeks for labour, which never comes, or comes imperfectly, or comes after long morbid delay. Such cases are comparatively not very rare, I believe, in the lower animals, as sheep and cows. In women they are very rare.

One well-marked example came under my notice some time ago. In it, the fœtus survived the natural term of pregnancy, and was enormous in bulk. As in cases of death of the premature fœtus, so in these cases the fœtus may be mummified and retained entire, or it may putrefy and be gradually discharged.

Dr. Keiller said that, although he had had some experience in delivering cats, and watching how kittens managed to get into the world, he had never had occasion to deliver a cow. He, however, knew that it was of no very infrequent occurrence for cows to have a missed labour, and that an unexpelled calf was frequently found, on killing a cow not known to have been pregnant, the calf being discovered in the uterus surrounded by a thick coating of lymph, or it might be, as in extra-uterine pregnancies, in the abdominal cavity, or partially expelled through the intestines. Dr. Duncan's mummified calf he considered an extremely interesting specimen.

Dr. Hammond mentioned the fact that, in Forfarshire, the cattle which were impregnated during the cattle plague almost invariably aborted.—*Edinburgh Medical Journal.*

DR. PETTIGREW ON THE CIRCULATION.

In his eighth lecture on "The Physiology of the Circulation in Plants, in the Lower Animals, and in Man," Dr. Pettigrew explained at considerable length the intimate relation which exists between the lungs and heart—the lungs circulating air and the heart blood. The lungs, he remarked, in their most rudimentary form, are mere sacs, walled off at an early period from the alimentary canal. They retain within certain limits the peculiar rhythmic movements which characterise the intestines. He compared the lungs to the hollow viscera as a class. In the water newt the lungs consist of a pair of elongated sacs, which have no laminæ or folds in their interior. In the frog internal ridges make their appearance, these increasing their respiratory or aërating surface. In the crocodile and turtle the ridges multiply and divide the interior of the lungs into cells; the differentiation going on in the lungs of birds and of mammals until those structures present a honeycomb appearance. By this means the aërating surface is enormously augmented. The lungs of serpents maintain their original tubular form, each terminating in an air-sac. The lungs of birds communi-

cate with the interior of the bones, and with as many as fifteen air-sacs. These sacs open and close rhythmically, and pass on relays of air at regular intervals. If the humeri or arm-bones of a bird be perforated, its trachea or windpipe may be tied without producing suffocation, respiration going on by the openings in the bones. The air-sacs have vessels ramifying on their surface, so that a certain proportion of the blood is aërated in them, as in the lungs themselves. The lecturer drew attention to the arrangement of the great vessels in the reptile, bird, and mammal. He especially directed attention to the large number of valves found in the heart of the bird, several of these being composed of muscular fibres. He believes the complicated and highly differentiated valves occurring in the heart of the bird are necessitated by the very perfect and elaborate respiratory apparatus; capacious lungs and a vigorous circulation being required to maintain the temperature and the muscular energy of birds flying and diving. He described the circulation as it exists in the mammal, and contrasted it with that found in birds. He adverted to the pushing and pulling power exerted by the heart, the ventricles pushing when the auricles are pulling, and *vice versâ*, and gave it as his opinion that, so long as the vessels are full of blood, collapse of their walls is impossible, fluids being very slightly compressible. He contended that, under these circumstances, a sucking power might be exerted either by the auricles or ventricles. He illustrated this by a very simple experiment. He took a large vessel with thin walls and fixed an ordinary syringe at either end of it. This done, he filled the vessel and one of the syringes comfortably with fluid, the other syringe being empty. The one syringe, he observed, represented the right ventricle, the other the right auricle. When the syringe representing the right ventricle was made to discharge its contents into the vessel, that representing the right auricle was made to draw into its interior a corresponding amount, the fluid being transferred from the one syringe to the other without in the slightest degree altering the calibre of the vessel. It is simply a question of supply and demand, and if the supply equals the demand, the vessel may be as thin as tissue paper and yet have no tendency to collapse. This is precisely what happens in the heart and blood-vessels. The quantity of blood in the vessels of the body is nearly always exactly the same. The cavities of the heart are of the same size, and when the one closes the other opens. The blood ejected by the ventricles makes the circle of the lungs and the body

and is received by the auricles, so that the blood is passed on in relays and according to measure. There is, therefore, no possibility either of confusion or accident. The lecture was illustrated by a large number of diagrams and by specimens.

CHAMBERS OF AGRICULTURE.

WHAT special purpose has been served by the institution of chambers of agriculture? That they are of some use in promoting agricultural improvement no one doubts, but in this respect they are no other than the older "farmers' club." Many an important practical question has been discussed with useful effect before both, during the three or four years which have elapsed since Mr. Charles Clay, of Wakefield, published the letter from which the chambers date; and many an important agricultural question, as steam cultivation, tenant-right, the game laws, and agricultural education—not to name the whole field of detail of which the theory and practice of agriculture consist—had been discussed by the older form of agricultural society long before the younger organization had been started. We had imagined that the idea of establishing chambers of agriculture throughout the country rose out of the impatience with which the rule forbidding the discussion of political questions at agricultural meetings was regarded. This, though generally an unwritten law, had, nevertheless, come to have force, if only as a custom, and at a time when many points of agricultural interest seemed ripe for legislation—when the "country" party were supposed to have a fairly definite programme, and landlords and tenant-farmers were believed to see eye to eye on most of the political questions of the day—it was intolerable that they should be hindered from combining for what promised to be effective urgency upon Goverment through the operation of an obsolete idea. The old prejudice, however, had to be respected, and so landlords and farmers united in the new form of association. That we believed to be the origin of the chamber of agriculture; but a recent meeting of the Cheshire Chamber of Agriculture throws some doubt upon this theory. Certainly, if the report of the council of this chamber is to be taken as authoritative, we need to reconstruct our ideas on the subject. It conveys the desire that "in future members will abstain from expressing in the chamber their own political views, when there is

ample opportunity for doing so elsewhere, as such conduct must necessarily endanger the well-being and existence of these excellent institutions." But this is going back to the scheme of the old agricultural society. It not only ignores, but actually protests against, the special purpose for which we had supposed that the newer association was intended. The more probable term of the alternative before us is that the council of the Cheshire Chamber of Agriculture is misdirected, and does not authoritatively interpret the fundamental principle on which these chambers are constituted. Nothing, indeed, could exceed the courtesy and good temper with which the rebuke of the council was in this case both administered and received. Lord Egerton of Tatton, who presided, defended the view of the council in the most temperate and courteous manner. Mr. G. W. Latham, whose opinions upon the land question had been condemned, argued the point with perfect temper, and, as we think, with complete success; and Mr. George Willis, a tenant-farmer, appears to us to have fairly hit the mark when he maintained that that chamber ought to be at liberty to discuss every question affecting agriculture, whether political or not. Nevertheless, it is right that attention be directed to the difference which arose—if not by the Central Chamber, to which some sort of undefined allegiance is, we imagine, due—at any rate by those journals which report the discussions of chamber and of club alike. It appears to us—and this example is only another illustration of a view which has been more than once expressed in these columns—that the former institution is not so fairly agricultural as the latter. It does not represent the tenant-farmer class sufficiently. It may seem a paradox to say so of an organization originally intended to exert an influence upon Government, but it is probably too much directed by members of Parliament. It seems to us to be in danger of becoming simply an agency for maintaining and extending the political ascendancy of one class. It is capable of great public service, if it be used to ascertain and convey the political opinions of agriculturists as a body. It will only be a shortlived item in the history of party politics if it be worked for the purpose of maintaining landlords in their position as the "natural political leaders of the country." And yet this is what it appears to us that it is in danger of becoming. How else are we to explain the hearty welcome with which the co-operation of the tenant-farmer is received in the work of distributing the burden of local taxation, which now lies so exclusively on land and houses—the comparative coolness with which he is

listened to on the subject of tenant-right or the over-preservation of game—and the snub which he receives when he ventures to express an opinion on the laws by which property in land is created or defined?—*Agricultural Gazette.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

GAZETTA MEDICO-VETERINARIA: DEDICATA AI PROGRESSI DELLA MEDICINA E DELLA CHIRURGIA DEGLI ANIMALI DOMESTICI.

(*Continued from p.* 561.)

Influenza.

By Professors Oreste and Falconio.

Clinical Form.—After mentioning that the adenitis equina has a special preference for horses from one to three years old, and that after this period it is somewhat rare, the ordinary symptoms of the benignant form of the disease are carefully enumerated. These offer nothing in the way of novelty, and a notice of them may be omitted here; only remarking that the writers recognise the fact that the disease may appear in a *sporadic*, as well as in an *enzöotic* and *epizöotic* form.

The *irregular* or *malignant* form of strangles differs from the other in the tumefaction of the submaxillary glands extending to the lips and parotideal region, which may cause suffocation by the compression it exercises on the trachea; the irritation of the mucous membrane reaching the pharynx, and the swelling of the laryngeal lymphatic glands, which may produce dysphagia; the persistently indolent condition of the tumefied glands; and the continuance of the nasal discharge, owing to the extension of the inflammation to the sinuses, the mouth, and the pharynx, and which leads to repletion of the guttural pouches with pus.

It sometimes happens that this discharge suddenly ceases, suppuration is promptly arrested, and a violent fever betrays the commencement of some internal inflammation, such as pneumonia or encephalitis—diseases of a secondary or metastatic nature. In such cases we may agree with Gleisberg in saying that the grave morbid condition of the internal organs, already prepared or developed contemporaneously

with the adenitis, is the cause of the sudden cessation of the suppuration and nasal discharge.

When the acute stage has been passed, the animal still remains diseased; it has lost its vivacity; the abdomen is retracted; the skin has lost its lustre; the appetite is in abeyance; there is constipation or diarrhœa; the respiration becomes altered; emaciation progresses, and at last the patient dies. In these cases the intestinal mucous membrane is affected with a chronic catarrh, and the bronchial lymphatic glands, as well as those of the inguinal and axillary regions, are tumefied and suppurating.

Sometimes the adenitis does not become completely developed; the irritation of the nasal mucous membrane and the discharge are insignificant, while the tumefaction of the lymphatic glands is slight, cold, and indolent. After from eight to fourteen days tumours appear in different parts of the body; these suppurate in two or three days, discharging unhealthy pus for a long time, while œdematous swellings occur in the thighs, sheath, and scrotum.

The fever accompanying adenitis, from being of an inflammatory character may, in certain cases, assume that of purulent infection; the nasal discharge is then of a brownish muco-purulent and corrosive nature; the glands, instead of suppurating, become gangrenous; œdematous tumours show themselves in various regions—lips, scrotum, under the abdomen, &c.—and soon ulcerate, assuming the characters of true ulcers, and covered with a sanious matter; the flow from the nose becomes fœtid, the Schneiderian membrane ulcerates, and a colliquative diarrhœa terminates the animal's life: this is pyæmia.

Sometimes the disease is complicated by suppurative arthritis of the carpus, tarsus, or coxo-femoral articulation, with consecutive caries of the articular surfaces, formation of fistulous sinuses, and symptoms of pyæmia.

In certain cases the nasal mucous membrane exhibits vesicles (*erpete flittenoide?*—herpes phlyctænodes), which are also observed on the lips, face, and other parts of the body; these become pustules, suppurate, and cicatrise; though some of them may unite to form an inflamed cord on the track of lymphatic vessels.

Pathological anatomy.—The lesions accompanying the benignant form of adenitis are chiefly confined to the Schneiderian mucous membrane and submaxillary glands. When dysphagia or dyspnœa has been present, there is found catarrhal inflammation of the mucous membrane of the pharynx, tumefaction of the pharyngeal lymphatic glands, and phlogosis of

the mucous membrane of the guttural pouches, which are filled with muco-pus; at other times there is inflammation of the lymphatic vessels of the nostrils and cheeks, tumefaction and suppuration of the superior tracheal lymphatic glands, and even those of the bronchi and mesentery. Some of the latter are frequently the size of one's fist, soft, and reddish-grey in colour, or indurated and undergoing caseous degeneration; their peritoneal envelope is opaque and thickened, and sometimes adherent to the neighbouring tissues; when this is the case the puriform matter is prevented from escaping into the abdominal cavity. In these instances the intestinal mucous membrane exhibits the lesions of chronic catarrh; the lungs are studded by cheesy cysts, due partly to the caseous metamorphosis of the lobular pneumonia, and partly to embolic foci (*focolai*). In addition, cuneiform cysts are also found in the kidneys, liver, and spleen. Collections of pus are met with in the peritoneum, pleura, and the subcutaneous connective tissues. The blood is rich in leucocytes.

The points of resemblance between adenitis and scrofula in the human being are next dealt with and commented upon. The constancy of the adenopathy (*adenopatie*), the great tendency the disease has towards recovery, the frequency with which the submaxillary and cervical lymphatic glands are involved, the presence of arthritis in the serious form of scrofula in man and the identical articular affection in strangles—all appear to favour the opinion that adenitis is nothing else than scrofula. What might distinguish them is their course; the first being acute, the second chronic. There is also the absence of the nutritive alterations of the skin, which are notably so frequent in man; though the chronic form of strangles is exactly like the human disease.

It would, therefore, seem that the adenitis equina is not a depurative malady, bringing about the excretion of infective matters; neither is it a necessary disease, as so many believe. It is a catarrh of the nasal mucous membrane, extending sometimes to the contiguous mucous membrane, with inflammatory tumefaction of the submaxillary lymphatic glands. At the beginning it is a purely local disease, but passes to the lymphanginitic condition, affecting the cervical and thoracic lymphatic glands; and from this results a general morbid state, an infection.

What is peculiar about this disease is, that it is readily propagated to the other organs, producing finally a humoral or general malady which may end in glanders and tuberculosis, as scrofula does in phthisis.

Etiology.—Adenitis equina affects the horse almost exclusively, but the reason for this is not known. Young horses are most liable to it, and conjecture might ascribe it to the greater development of the lymphatic system in them. Certain conditions favour its appearance in youth, such as dentition, a delicate constitution, improper hygiene, inhabiting cold stables, a sudden change from green to dry food, and the use of oats and new hay. The occasional cause is to be found almost exclusively in chills; the disease is most common in cold rainy weather, in spring and autumn. Once developed the adenitis equina has the power of transmission by contagion. This was denied by Delabere Blaine, Clater, Huzard, and others; but corroborated by the majority of practitioners, and demonstrated experimentally by several authorities, among them being Viborg and Reynal. The contagium is fixed (Spinola), and its action is limited to the equine species; the foal being much more susceptible to its influence than the adult horse. In the experience of Professors Falconio and Oreste, it is only necessary to make a healthy foal cohabit with one suffering from the disease to produce the malady in it; but an adult animal may dwell beside a sick one with impunity.

With regard to the question of a second attack, it appears to be established that one attack affords exemption from another. A military veterinary surgeon has never witnessed, among six hundred horses, a second appearance of strangles. Hering has remarked that it is not contagious in all its stages, but only when it is most developed. Donnarieix is of the same opinion.

It has been stated that the disease is unknown in hot climates, that it is rare in Spain and Africa, and scarcely known in several provinces of Russia. Huzard believed this exemption was due to the alimentation of the horses on barley and straw, instead of hay and oats. Rodet assures us that in Italy, Spain, Egypt, and Arabia, horses do not contract the disease so long as they remain in their own country. The facts cited by Desplas, and the observations made in Asia, Africa, and Italy, demonstrate that this assertion is erroneous.

Prognosis.—When the disease is benignant the prognosis is favorable; but if irregular, then much will depend upon circumstances. When it assumes an unsatisfactory course under a suitable method of treatment, and the consecutive morbid states appear, then the cure is problematical and the prognosis, if not unfavorable, should at any rate be reserved. In malignant cases a fatal termination may be anticipated.

The medical treatment of the malady is fully described, and the various operations necessary at times are detailed; but as there is no absolute novelty introduced, I need not inflict a longer notice of this able article on the readers of the *Veterinarian*.

CENTRAL VETERINARY MEDICAL SOCIETY.

The ordinary general meeting of this Society was held at 10, Red Lion Square, on Thursday, July 4th, 1872, the President, G. Fleming, Esq., in the Chair.

After the confirmation of the minutes, Mr. J. Woodger, jun., laid before the meeting a specimen of a vertical fracture of the large pastern bone. The animal when examined was found to be unable to rest the foot on the ground, and although no displacement existed, the case was diagnosed as one of fracture of *os suffriginis*. The horse being of little value and perfect recovery somewhat doubtful, he was destroyed. The discussion which ensued turned chiefly on the probability of recovery, the general opinion being that the case was one in which a favorable result might have been anticipated.

The *President* next produced a specimen of anchylosis of the vertebræ in which the interosseous ligaments were completely ossified. He afterwards drew attention to an equine affection now prevalent in Wurtemberg and Bavaria, which would appear to bear some resemblance to staggers, termed by the Germans "immobility." It is not contagious. The disease was not confined to any particular district, although it chiefly attacked the coarser breeds of horses. Its attack seems to be uninfluenced by food, fatigue, or bad ventilation of the buildings in which the animals were kept. The earlier symptoms are those shown in congestion of the brain, namely, profuse perspiration about the head, glistening eyes, a difficulty in walking, and a staggering gait. The pulse is fuller and slower than normal, the respiration deep but not hurried, and paroxysms of fury following those of stupor. It is generally fatal. The treatment which had proved most successful was that employed by M. Gierer, of Turkheim, who used cold *douches* to the head at the commencement of the disease, following these up by blisters behind the ears and administering sulphate of soda, tartar emetic, and occasionally calomel. During the paroxysms M. Gierer employed enemas containing chloral hydrate, and, as he believed, with some advantage to the patient.

The *President* also referred to the recent researches of Prof. Hering into the quantity of cerebro-spinal fluid as having relation

to this malady and some other disorders of the nervous centres. Hering studied it in its physiological condition. The cerebrum and cerebellum being in close proximity to the cranial walls, not much room is left for this fluid; but round the medulla oblongata and spinal cord, where a comparatively large space exists, a considerable quantity of the fluid is met with. In order to ascertain the relative distribution of this fluid within the cavity of the cranium, a horse was killed, and the roof of the atlas with that of the cranium removed by mallet and chisel, the end of the medulla external to the dura mater being tied. The head was then exposed to a freezing mixture, and afterwards opened, when it was noticed that around the medulla oblongata and cerebellum, between the dura mater, and arachnoid there were flakes of ice, weighing from 90 to 120 grammes, and small flakes within the ventricles of the cerebrum, while the frozen fluid surrounding the spinal cord was found to weigh 400 grammes. This fluid under ordinary conditions exists in a closed sac between the membrane, and is not influenced by gravitation, hence it is most probable that an inordinate quantity in any part would occasion serious compression. The quantity of fluid the spinal sheath contains cannot be easily ascertained when an incision is made during a *post-mortem* examination, as the fluid is only thereby partially removed. Hering also observed that the quantity diminishes gradually after death, the cerebral or medullary substance appearing to absorb it, hence the difference in the results quoted by different authors. Renault, Leisering and others, estimates the quantity at 120 to 430 grammes in healthy horses. Supposing, therefore, the normal quantities to be as stated, and it is not known that they exceed this amount, it was a mistake to suppose that so-called "Immobility" was due to compression of the nervous centres, in or around the brain, for as the sheath was continuous therefrom, such pressure would also influence the functions of the cord, which is not the case.

Mr. Clarke reported several cases of spinal apoplexy in mares, caused, he believed, by the recent hot weather. One case had followed another attended by rapid decomposition after death. The *post-mortem* examination showed serous effusion, but no ecchymosis.

The *President* intimated that on an early occasion he would call attention to a disease now prevalent amongst horses on the Continent of Europe, and in Algeria, as yet unknown here, bearing some resemblance to syphilis of man.

Mr. J. R. Cox related a case of a cancerous disease of the tibia of a dog. The animal—a mastiff—was a great favourite, and expense of treatment of no importance. The external appearance of the part was that of a simple tumour. He proposed to remove

this under the influence of chloroform. With the assistance of a medical friend, a close examination, however, was made which led to the abandonment of the operation. After a time the animal was destroyed, all treatment proving valueless. The tumour, which had now grown larger, was of symmetrical form, but the bone structure was soft and crumbling away. The diseased state of the osseous tissue extended to the articulating surface.

The *President* announced the election of Colonel Fitzwygram, as a Fellow of the Society; also the nomination of John Wilkinson, Esq., Principal Veterinary Surgeon to the Army, as an Honorary Fellow, in recognition of the warm interest and active support that gentleman had ever taken in promoting the best interests of the profession.

In concluding the business of the meeting the *President* said that it was the last that would be held prior to the Annual Meeting in October 3rd. He congratulated the Fellows on the strength of the society and its financial condition. He also reminded them of the need for papers being furnished beforehand.

The meeting then adjourned. Present—12 Fellows, and 2 visitors.

James Rowe, Jun., *Hon. Sec.*

WEST OF SCOTLAND VETERINARY MEDICAL ASSOCIATION.

The West of Scotland Veterinary Medical Association held its quarterly meeting in the Athole Arms Hotel, Dundas Street, Glasgow, on Wednesday, the 24th *ultimo*, at two o'clock.

The President, Daniel McLean, Esq., occupied the chair.

Present:—Professors Williams and Walley, of the Edinburgh Veterinary College; Fordie, of the Glasgow Veterinary College; Messrs. Connacher, of Selkirk; Bryce, Stirling; Stewart, Perth; Pollock, Coatbridge; Sharp, Hamilton; Kerr, Beith; Laing, Falkirk; Finlay, Royal Artillery, Leith, Fort; Prentice, Glasgow; William Anderson, Glasgow; William Anderson, jun., and the Secretary—James Anderson.

After the minutes of the previous meeting had been read and confirmed, the Secretary read letters from the following gentlemen, expressive of regret at not being able to be present:—Messrs. Thomas Taylor, Manchester; George Morgan, Liverpool; William Fearnley, Leeds, and C. Hunting, South Hetton.

The *President* next proposed and *Mr. Prentice* seconded, "That Professor Walley be elected an honorary member of the Association." Proposal unanimously agreed to.

The Professor returned thanks, and remarked that he felt proud in being elected an honorary member of such a flourishing Association as this, and that he would endeavour to attend its meetings regularly, and do his best to promote its welfare.

Proposed by the *President,* and seconded by *Professor Fordie,* "That Mr. William Anderson, jun., be elected a member. Elected unanimously.

The essayist, Mr. Walley, was then called on by the President to read his paper on "Tuberculosis." Previously, however, some interesting morbid specimens, illustrative of the subject of the essay, were laid before the meeting.

Mr. President and Gentlemen,—The subject which I am about to bring before you this evening is one of immense importance, not only to veterinary surgeons, but to the public generally; to the veterinary surgeon, because no subject offers more food for earnest thought, or more ground for scientific research; to the public, because it has a very close connection with the great social problem of providing our masses with a sufficiency of nourishing and healthy food. To the stockbreeder and agriculturist it is even of greater import, as by the spread of such a disease—and it is undoubtedly on the increase—his best hopes are rendered fallacious, and his profits materially curtailed. To the causes of the spread of the disease I shall have to refer hereafter.

In proof, Mr. President and Gentlemen, of my assertion that the disease of tuberculosis has of late years greatly increased, I will call your attention to a remarkable passage in the 'Veterinary Record' for January, 1847, p. 29, in which the following note by the editors (in commenting on a case of tuberculosis, the particulars of which were furnished to them by Mr. W. Cox, of Ashbourne) will be found:—"The tumours attached to the viscera of the thorax of a cow are similar to some we have *occasionally* met with.

"On this subject our English veterinary authors are silent, and we believe the above to be the only case of the kind recorded."

A quarter of a century has elapsed since these lines were penned, and one only of the three who were responsible for them now remains to bear witness to the vast strides that have been made, during that period of time, in our knowledge of tubercle and the disease to which it gives rise.

Other authorities, too, who at this time looked upon tubercle only as a chance product, have gone to their long homes; some of them, perhaps, equally as ignorant of its true nature as they were on the day of their birth.

Not only has the disease increased of late years amongst our ordinary domestic animals, but its ravages are widely extended to the feathered tribes, and even to such partially undomesticated animals as rabbits, rats, and others of the rodent species.

Looking upon and contemplating an individual tubercle, we might be led to despise its apparent insignificance, and to ignore the deadly meaning of its presence; but when we see thousands upon thousands of these knots existing in an organism a truth is forced upon our minds which we cannot refuse to recognise, viz., that we have to deal with an enemy at once insidious in its approach and fatal in its progress.

Independently of its ultimate fatality, I think I may safely say that no morbid substance found in the organism of animals, or of man, is so protean in the number of functional derangements it gives rise to, for at one time accumulating round the œsophagus, it prevents one of the first acts necessary to the maintenance of organic life, viz., deglutition; at another time interfering with the functions of the testicles, producing sterility; again, pressing on the neck of the bladder, giving rise to retention of urine, and in some instances rupture of the bladder itself; now compressing the cystic, pancreatic, and salivary ducts, obstructing the flow of the bile, pancreatic juice, or saliva, into their natural channels; then blocking up the vessels of the brain or portal vein, inducing the effusion of serum; pressure and paralysis in one case and ascites in the other: yet replacing the natural structure of the lymphatic glands, preventing the due absorption of the materials necessary for nutrition; further, by its presence in the ovaries of the female exciting persistent and maddening nymphomania, occasionally becoming deposited in the synovial membrane of joints, setting up synovitis and anchylosis, and, worse than all, by obliterating the air-cells of the great blood purifiers—the lungs—preventing the proper decarbonization of that fluid to which all the tissues of the body owe their origin.

In considering the subject of tubercle, my aim will not be to enter minutely into its structure, but rather to consider its more practical bearings: nevertheless, it is necessary for the proper understanding of the matter, that I should enter somewhat into detail, for I am aware that many of you have not the opportunity of investigating these questions, as you have other knots to unravel than the one under consideration.

Designations are three, viz.:—Tuberculosis, Scrofula, and Struma.

The first is derived from *tubercle*, "a little swelling," or a "knot."

The second, from a Greek word, signifying "swine evil," or "swine swelling," from a notion that pigs were subject to it, and dates back even from Pliny.

The third, derivation uncertain, but is thought to be from words signifying "I heap up," or "I grow insensibly."

Each of these terms (as also "king's evil," as it is called in the human subject) are unsatisfactory, and lead to no idea of the true pathology of the disease; indeed, it would be difficult to coin a term truly indicative of this peculiar state of the system, and, as Dr. Bennett says, "it is questionable whether it is worth while, since it (tubercle) is so universally used and understood to substitute another for it."

Scofulous or strumous tubercle would each distinguish it from other abnormal products.

Tuberculosis is generally arranged under three heads (or rather its different characters); hence we have—(*a*) miliary or granular tubercle, from its resemblance to small granulations, and from its millet-seed shape and size; most frequently found in the meninges of the brain and spinal cord, on the surfaces of bones, the pleura, and peritoneum, and, in the horse, in the lungs, as an accompaniment and consequence of glanders; and here I may state my opinion that glanders is nothing more than a form of tubercle, produced by the same causes, running the same course, and ending in the same manner, with identical symptoms, viz., cough, discharge from the nose (the horse does not expectorate), ulceration of air-passages. With regard to the ulceration of the Schneiderian mucous membrane, it may be asserted that it is altogether dissimilar to that of tubercle, but in reality it is not so; and we must not forget that ulceration is only the local manifestation of a systemic disorder, and differs according to the anatomical characters of the structures implicated—consumption of the soft structures of the body, and miliary tubercles in the lungs, frequently coalescing and becoming putrid from exposure to air constituting vomicæ.

(*a*) Miliary tubercle also occasionally affects the muscular structure of the heart, one case of this kind being on record by Mr. Gowing.

(*b*) Infiltrated or diffused, when found in masses more or less large, distributed within, and on the surface of organs, and very frequently accompanied by or associated with large quantities of true inflammatory lymph, which glues those surfaces, not only together as one intestine to the other, but also to the internal parietes of the cavities in which they are contained, as the intestines to the abdominal walls.

(*c*) Encysted, or enclosed in a cyst or lymph sac; frequently seen in the interior of the liver and lungs.

One only of these forms may exist in an animal, or it may be the subject of all, and even one organ may have within its structure encysted tubercles; underneath the coats of its large vessels infiltrated, and externally granular.

Tubercle gives rise to several distinct, nosologically arranged diseases, and, like the different kinds of tubercle, one only of these diseases may exist, or several together, or one may be, and frequently is the natural sequence of the other. Thus we are in the habit of speaking of tabes mesenterica, phthisis, tubercular meningitis, tubercular arthritis, tubercular hepatitis, or what, in my estimation, would be better, hepar tuberculosis, tubercular ostitis, and tuberculous glands.

Tubercle is frequently confounded with other morbid products, particularly cancer, and the changes brought about by parasites; but can be distinguished from either by careful examination. Some authorities deny the possibility of cancer and tubercle coexisting; others hold that such may occur, and cite cases—Lebert and Martin, of Munich (*Lancet*, August 16th, 1845). That tubercle and parasites are frequently present in the same animal is an acknowledged fact, a good example of this kind, in the horse, will be found recorded by myself in the *Veterinarian* for January, 1864.

Characters of Tubercular Formations.—These vary according to the structure invaded and the age of the deposit.

In the first stage, it is lymphoid in character, as demonstrated by Paget; afterwards it assumes several forms, as the gray or solid, being of a solid compact structure, and when cut into resembling tough cheese, or wax; and the yellow, or soft, being more loose in structure and of a curdy appearance or consistence. In its degeneration we have cornification and ossification of gray—and it is this which is likely to be confounded with the structural alterations produced by parasites, fatty degeneration, suppuration, and cretafecation of yellow. Cretafecation likewise being confounded with parasitical productions, and in conjunction with cornification and ossification, thought to be due to an effort on the part of nature to imprison the tubercular matter, and thus prevent it working further harm to the system. Albuminous and fatty degeneration are often found associated, and all of the degenerative processes may be going on in one organ simultaneously.

The albuminious degeneration is seen most frequently in the laryngeal lymphatic glands of young animals, especially cattle, and when the sac is opened it escapes as a yellowish, cohesive mass, resembling coagulated synovia, only more opaque.

The true tubercular pus is thin, turbid, yellowish-white in colour, with portions of cheesy matter intermixed, or floating in it, inodorous, and having small cells of an irregular shape, and without a distinct nucleus.

Microscopically.—Tubercle is found to consist of corpuscles, irregular in outline and size, having in their interior granular or molecular matter, with granular matter scattered between the corpuscles, and, according to Bennett, possessing neither nucleus nor nucleoli; but I have myself, in company with Professor Williams, seen true nuclei in tubercle from the brain of a calf (to which case I shall have hereafter to refer), very much resembling that from the same situation figured by Virchow, and in rare cases only having fibres interwoven with the corpuscles.

Tubercular formations differ from those of cancer, although probably, in some instances, traceable to similar causes, in being more rapid in growth; by their tendency primarily to attack lymphatic glands, by being encysted, softer, and non-fibrous; by not having so great a tendency to spread to surrounding tissues other than those in which they first make their appearance; by not possessing the corded processes so indicative of cancer, by attacking animals of all ages, and having no reproductive powers when extirpated. The pus of cancer is thinner, more ichorous, and irritative; the cells of cancer are larger, surrounded by a fibrous stroma, assume any shape, and are filled with perfectly formed young ones. The cells of pus also are larger than those of tubercle, rounder, more regular in outline, and when acetic acid is added show a well developed nucleus or nucleoli.

The ulcers of tubercle, when appearing in the skin, are characterised previous to their external irruption by the subcutaneous structures becoming glued to the enveloping dromis, and remaining closely adherent to it even when the ulcer is healed; the skin also becomes extensively undermined and thinned. The edges of the ulcer after irruption are thin, tapering, and irregular: this kind of ulceration is most frequently seen in dogs. In ulceration of mucous membrane the pressure of the growth causes gradual absorption and thinning, allowing of the escape of the tuberculous matter through the orifice, with the yellow appearance of the tubercle plainly visible in the opening. We never have the soft, inverted, jagged edge of cancer or its livid colour and fumigoid, cauliflower granulations, but we occasionally have sinuous external openings, in some instances, two or three to one tumour.

Tubercle may exist, and frequently does, as one immense mass, or scattered throughout the whole system in a number of masses, collectively many pounds in weight. Cancer is more frequently solitary, and increases very slowly.

Chemically considered tubercle, according to some authorities, is composed of nearly the same elements as protein, viz., carbon, oxygen, hydrogen, and nitrogen; and by Garrod it is said to be made up (I presume he speaks of the calcareous stage) of animal matter, chloride of sodium, phosphate and carbonate of lime, and oxide of iron.

Of the fluids of the body the *blood* is the only one shown to undergo particular change in this disease: its red cells are diminished, its fibrin and albumen altered in character, and either increased or lessened in quantity.

Animals subject to Tubercle.—I will first premise that no domestic animal is free from this disease in some form or other, either idiopathically, hereditarily, or acquired—though perhaps in some instances the fact may have escaped the notice of observers. Horses, cattle, pigs, dogs, cats, fowls, the rodent tribe—all are subject to it.

In an article in the *Edinburgh Medical Journal* for February, 1867, M. Villemin states his belief that dogs are not the subjects of tubercle unless as the result of inoculation. Birds he considers free from it. Both these are mistakes, and result from the want of opportunities of observation. I have seen it frequently in the dog; also a case in a young rook this last summer, and in a Cochin-china cock, the property of Professor Williams, which died at the college in June last, and whose liver was more than half replaced by tubercles of various sizes, independent of several large masses between the muscular and mucous coat of the intestines. And Professor Williams has related numerous cases to me amongst canaries, &c.: to this I shall refer hereafter. A large tumour was forwarded to me taken from the pelvic region of a pig by Mr. Wheatley, V.S., in May last, weighing five pounds, composed almost entirely of gray and yellow tubercle, with a few fibres interwoven, although at first sight it appeared to be a simple schirrous tumour. In this animal the mesenteric glands were considerably affected also. In rabbits it occurs to a frightful extent in some parts of the country, and I know from my own experience that in them it is capable of being propagated by inoculation.

Amongst cattle, though of no breed or class can it be truly said that it is exempt from tubercle, the highly cultivated and distinct breeds are most liable, especially when exposed to causes favorable to its production.

Development or formation.—How is it formed? whence comes it? what is it? are questions that have been often asked. One man will tell you, that it is altogether a miserable and pitiful production, another that it is a contemptible abortion, another that it is the lowest form of morbid production with which we are

acquainted, and so on. Nevertheless, in spite of all these expressions of contempt, it continues its destructive career, and is strengthened instead of weakened by age.

Many pathologists look upon it as simply a degenerated exudate, the result of inflammatory action occurring in a system already debilitated by disease, or constitutionally liable; others equally as eminent aver that it is the product of a specific morbid poison or virus in the blood. Much argument may be advanced on both sides, and it is necessary that we should carefully consider the *pros* and *cons* of each.

One word in commencing as to the cell theory of formation. Those who deny the presence of cells in tubercle use this as an argument of its non-reproductive powers, but is it absolutely requisite that we should have cells for the reproduction of a specific disease? who has demonstrated the presence of a cell in the virus of rabies, or in the infection of many of the forms of fever with which we are acquainted?

The Exudative Theory is this:—1. Inflammatory action commences in a part. Lymph is exuded into the connective tissue of the organ or organs affected, and from want of organizing power within itself, or deficient vitality in the parts immediately surrounding, it undergoes tubercular, fatty, or suppurative degeneration, or in some cases liquefies and becomes absorbed. The great argument of those who hold this opinion is, that no tubercle existed before the inflammation, but how are they to know this? 2. That wherever tubercle is found, there also will spots of inflammation be discovered, or coagulable lymph. Now, without attempting to deny that tubercle is so produced, I shall endeavour to show that this is not the case in every instance, and that in far the larger majority. Further, that allowing in these instances the primary inflammatory origin of tubercle, its continuance and growth must depend upon other causes.

1. Does inflammation proper ever attack a number of structures at once; *i. e.*, have we inflammation of a serous membrane, a synovial membrane, a mucous membrane, a medullary membrane, osseous texture, glandular structure and parenchyma, existing at one and the same time? If the result of inflammatory action, how is it that in tubercular meningitis we have no premonitory symptom of cerebral disturbance until the moment that effusion takes place from pressure, and the animal drops powerless to the earth? Can any inflammatory state be pointed out wherein we have successive formation and degeneration of the exudative products, and where we have in some parts of the system nodules of disease no larger than a pin's point, and in other parts growths of some pounds weight? (Pyæmia is the result of a morbid poison). Undeniably at some period all the growths have

been more or less small? How is it that we seldom or ever see tuberculization as the result of traumatic inflammation? In many instances we find large masses of coagulated, partially organized, and fully organized lymph in the abdominal and other cavities co-existing with the tubercular deposits. If tuberculization is due to degeneration of an inflammatory exudate, why does not this lymph undergo a similar change? (See also Dr. Rutherford Haldane).

Patches of inflammation most certainly are frequently found in the interior of organs affected with tubercle, but in my opinion they are only secondary. In the granular tubercle in cattle familiarly known as grapes, we have immense masses of tuberculous growths both on the pleura and peritoneum in many instances without the slightest ascites or adhesions of any kind. And we frequently find small miliary tubercles existing in lowly organized structures and serous membranes without the slightest trace of inflammation around them. In the livers of animals I have seen half the area of the gland occupied by encysted tubercles of various sizes, and yet the true gland structures, where not invaded by tubercle, remain structurally perfect; in these cases we have no ascites of the abdomen. On the other hand, I have seen the liver largely invaded with infiltrated tubercle, enlarged and solidified; in these cases we have ascites from pressure on the portal vein and posterior cava. And here I would remark, that in so far as my experience goes, we have a much greater amount of structural disease in the infiltrated, than in the encysted or granular form of tubercle.

Now, gentlemen, since I do not allow that tubercle is the *simple* result of an inflammatory exudate, How, you will say, do you account for its formation?

Tubercle is as much a specific disease as is syphilis, or any other affection depending for its continuance in the system upon a morbid poison or principle, and this virus is discernible in the morbid products, and is capable of being transmitted by inoculation, providing the system is in a condition to allow of its propagation; and, further, that tubercle is dependent upon a true dyscrasia, and, like other diseases of a similar character, it cannot, as a rule, be produced by inoculation in the system of an animal which is already labouring under another dyscrasia, as was accidently proved by me in the inoculation of a dog suffering from distemper. Since forming this opinion I find it exactly coincides with that of M. Villemin, to which author I have before referred.

As to the period of growth or degeneration at which tubercular matter takes on its reproductive character I am not prepared to say; but that it is in some particular stage absorbed into the

blood (and that the blood is changed in its character no one denies), and deposited in various parts or places of the body, either in the connecting tissue, or in the outer surface of the coats of the small vessels, and there by its presence exciting, in some instances, sufficient action in the surrounding vessels to ensure a supply of fluid for its nourishment and growth by imbibition; in other instances, depending probably upon some peculiar condition of the blood at the time, setting up a large amount of inflammatory action, and rapidly increasing; its rate of development also being regulated by the suitability of the pabulum in which it may be deposited. Of all this I say I am perfectly convinced.

Morbid products, simple and innocent in themselves, may, under peculiar circumstances, be converted into malignant and disease producing germs.

Mode of Growth.—According to Virchow this goes on by proliferation of the cells of the connective tissues; but, if I am correct in my view, it goes on from either internal molecular growth, or by inducing the flow of an exudate from the surrounding vessels, each successive portion of which degenerates into a substance similar to the primary one. In some instances the presence of blood-vessels has been demonstrated within tubercles, and doubtless the nourishment, in such cases, would be derived directly from these vessels.

The growth of tubercle always progresses much more rapidly in the young than in the adult animal, inasmuch as in the latter the textures are much more perfectly organised and consolidated, thus for a longer time resisting the influence of any element of change which may be brought in contact with them; and, as Addison truly remarks (p. 190), "The anatomical structure of the infant is, as we have shown, materially different from that of the adult; nutrition and growth are more energetic; all the tissues are imbued with active morphological agents. The blood circulates with greater rapidity, and the newborn sympathies of sentient elements are more alert."

Mode of Degeneration.—This is thought by some pathologists to be due to chemical changes within the mass, and as a consequence that degeneration commences centrally, other pathologists are of opinion that degeneration commences peripherally, and is due to the action of the living tissues surrounding it, fluid from which is transuded which gradually breaks the mass down. Both these views are correct, for degeneration does not proceed similarly in every tubercular mass. In fatty degeneration we have the action commencing in the centre; in suppurative degeneration it commences peripherally; in the cheesy tubercle it will frequently be discovered, on making a section, that the centre of the mass is

compact, and of a reddish colour, while the exterior is soft and of a lighter tint. Occasionally we find a layer of jelly-like material thrown out between the tubercular mass and the cyst which encloses it, the mass being, indeed, connected to it, but easily separable from it. This was beautifully exemplified in the liver of the cock to which I have before referred.

Production by Inoculation.—Such a mass of evidence is now obtainable on this point that it would seem almost marvellous that any authority should deny the production of tubercle by inoculation. The opponents of inoculation state that the presence of tubercular matter in animals that have been operated upon is simply a coincidence; but it is absurd to suppose that in every case out of the numerous experiments that have been instituted this is so.

Professor Williams and myself have each succeeded in propagating it by this method. Paraskera and Zallonis, of Syria, in Greece, in the *Lancet* of June 8th, cite five experiments on rabbits, where tubercle was produced by inoculation, and one in a man; but inasmuch as the latter was suffering at the time from a debilitating disease, it can scarcely be looked upon as a fair experiment. M. Desmartis, of Bourdeaux, succeeded in the inoculation of plants with tubercular matter, thus showing its extraordinary vitality and reproductive powers. M. Villemin has conducted a number of experiments, alternating them, upon a variety of animals, nearly all of which tend to the establishment of the inoculative theory; further, the latter authority states that the matter which is produced at the seat of the inoculation is equally as capable of generating tubercle as is the lymph of small-pox of generating that disease, and that abortion or premature death of the offspring frequently follows the operation; no doubt from the impure condition of the blood, as is frequently seen to be the case when the system is labouring under the effects of any other specific virus, as in pleuro-pneumonia, rinderpest, &c.

Enzöotic, or Sporadic character.—Does tubercle ever occur in this form? Undoubtedly it does. I have seen it on several occasions rage in quite a sporadic manner. In a very short radius near Bolton, in Lancashire, about eighteen months ago, a larger number of cattle died from this disease than had been known for many previous years, one knacker alone having upwards of twenty carcases. Mr. Lowe, of Bolton, in a communication on the subject to me since, attributed this outbreak to the wet season which prevailed some time previously.

Virchow says, "It seems probable that tubercle may be at times epidemic;" and "as with plants, so with tumours, certain seasons of the year produce an increased growth."

Spontaneous Generation.—Tubercle is capable of spontaneous

generation like any other morbid virus, *i. e.* if all circumstances are favorable to its production. I know there are those who deny the possibility of this phenomenon taking place under any conditions or with any disease. Let us consider the matter :—

Is it, or is it not, an immutable law that when two or three elements are brought together in certain proportions, and under certain conditions, life is the result? What of the virus of pyæmic pus which has been so recently produced and modified in intensity from healthy pus by Dr. Burdon Sanderson? What of the virus of rabies—a principle isomeric with many harmless agents: impalpable, imponderable, imperceptible, immensurable, and undefined, yet terribly destructive in itself when it meets with a suitable pabulum? What of the production of blennorrhœa in cows that have never come in contact with one of their own species, as has been proved in my own practice in several instances, by becoming developed as a result of the acrid discharges following parturition? I say most positively that, under certain peculiar conditions of the system, the glands of the mucous membrane take on a morbid action, and spontaneous blennorrhœa results. If matter under peculiar circumstances ignites, it is called *spontaneous combustion*, though the actual flame was never there; so when the unition of certain elements in a system produce a morbid virus tending or giving rise to a specific disease, it is none the less *spontaneous generation*.

Whence came the first of the numerous contagious diseases with which we are acquainted? Is not the same Power in existence now to bring fresh cases of peculiar and hitherto unknown diseases into the world as heretofore? How many of the diseases which now exist were unknown only a few generations ago? How is it that in splenic apoplexy—a disease engendered, as you all know, by peculiarities of land, season, and climate—we have the flesh of animals, which die from it, undergoing such alterations as to cause certain death to other animals feeding upon it? And how is it that a horse may at one time have simple cracked heel which is benign and un-inoculable in its character, whilst at another a disease is generated in the same limb capable of producing by inoculation a contagious and well-defined affection in other animals?[1] As also in carbuncular anthrax, in which affection the very fluids on coming in contact with the skin of man produce extensive disease, and frequently death?

Is Tubercle Congenital?—I think this, in the absence of absolute proof, is very questionable; at any rate, I have never

[1] Paget, p. 373 :—"A man had inflammation of the lymphatics of the arm, and of the glands of the axilla, on board ship, as the result of an injury from a beef-bone; he died. The sailor who washed his clothes followed, and nearly all on board had similar diffused cellular inflammation, inflammation of lymphatic glands, or low fever.

met with a single case of true tubercular disease in a fœtus. I know that some specific diseases are congenitally transmitted, but I question whether this particular one is. It has been argued, that the fact of young animals becoming the subject of tubercle is a proof of congenital transmission; but the value of this idea is somewhat detracted from by the rapid manner in which tubercle is propagated by inoculation. On the other hand, it may be that the blood of the young animal may be imbued with some peculiar tubercular principle, which only waits favorable circumstances for it to become developed, and we have not to look far for instances in which morbid virus retains its vitality for many weeks out of the body even, as witness the length of time the virus of small-pox is preserved in glass tubes, and the length of time intervening between the receipt of a bite from a rabid dog, and the period at which symptoms are shown; as also with amœba and rotifers, which retain vitality even when nearly dessicated, and await only lodgment in a suitable pabulum to start into newness of life.

The fact of a mother being in a weakly state during pregnancy does not hypothetically explain satisfactorily the production of congenital tubercle, as we frequently find mothers whose blood is deteriorated, not only from a bad quality of food, but also from the presence in their system of actual organic disease, give birth to strong healthy progeny so long as there is no specific disease of the blood. And this strengthens my opinion that tubercle is a specific disease, and that other causes are in operation to produce it besides debility or inflammation.

"Tubercle," says Virchow, "is a disease of *extra-uterine life;* hereditary, but not congenital: hereditary, not as a disease, but as a disposition."

Intimately mixed up with this section of my subject is the *hereditary* or *non-hereditary* nature of tubercle. If it is proved it is congenital, the question is at once set at rest; but is the disease hereditary, *i. e.* is it in existence at the time of the animal's birth, or rather, I should say, are the elements of the disease present in the system of the young, or is there only a liability to this particular form of disease from peculiarity of structure or conformation of texture? Ophthalmia is said to be hereditary; granted that it is, in so far as similarity of structure is concerned, thus rendering the eye more susceptible to inflammatory action; so with naviculartharitis, &c. There is only a tendency from consanguinity probably intensified by the system of in-and-in breeding, and from imperfect organisation. That this tendency may actually become developed into a positive dyscrasia, under favorable circumstances, I do not deny, and have even endeavoured to show that such is the case. No doubt, as says

M. Billard (Addison, p. 197), "The ovum must be influenced by the condition of the mother, children having been born healthy, sick, and convalescent, or recovered from former disease."

Is Tubercle Infectious or Contagious?—I have seen, Mr. President and Gentlemen, many circumstances in the human subject, painful circumstances, too, that have biassed me strongly to the side of those who believe in the infectious nature of tubercle, at any rate, at certain distances, and provided always that the system of the exposed individual is in such a peculiar condition as to pre-dispose it to the influence of the infection. On the other side, I have seen a cow remain in a stock for months and years, known to be the subject of phthisis, without any other animal becoming affected, either at the time, or subsequently.

As to contagion: it has one thing necessary to establish the contagious character of a disease, viz., the fact of its being capable of propagation by inoculation. Some remarkable and decisive facts have come under the notice of my colleague, Professor Williams, as to both the infectious and contagious character of tubercle amongst birds, and these facts I have no doubt he will be happy to relate himself.

If the contagious character of tubercle is established, another (though perhaps a remote one) source of contamination is opened up before us, viz., from persons or animals eating raw or improperly cooked meat, or more strongly, livers or other internal organs, from animals that have suffered from this affection.

Predisposing or Exciting Causes.—These are of as much importance to us, and as well worthy of consideration, as any part of this subject, inasmuch as in a proper knowledge of these is foreshadowed, the means to be had recourse to in prevention. First and foremost, then, we must place an hereditary predisposition or conformation, especially if intensified by increased or multiplied consanguinity; hence we find that narrow-chested, light-barrelled animals are very susceptible to tubercle, and this conformation is always transmitted from parent to progeny, and becomes strengthened by each transmission, thus accounting for its appearance in herds where breeding in-and-in has been carried on to a great extent; light coloured animals are also supposed to be more susceptible, though my experience does not bear this idea out; debility, arising from any cause (and this is the great cause of tubercle with some authorities); a general constitutional weakness (which may or may not be hereditary) will most certainly render an animal more amenable to the exciting causes of the disease; but how many people, as well as animals (of sound, untainted constitutions), are subjected to hunger, exposure, noxious exhalations, variable temperature, fatigue, and disease,

without manifesting the slightest tendency to tubercular formations? Thousands upon thousands, we may say. And, again, how often do we see the disease appear in young, healthy, vigorous animals? Deficient drainage, bad water, poor herbage, damp, clayey soils; hence, it is more prevalent in certain soils, especially if much exposed, mossy, and prolific of iron-grass: and peculiarity of climate; either of these causes may act singly or together. I have many facts in my possession bearing out this view of the causes, and I am of opinion that in particular soils or localities the disease is contracted without any hereditary idiosyncrasy, as I have seen cattle, horses, sheep, and pigs affected on such farms, and even animals of an entirely different breed, and brought from distant farms, of an entirely different character of soil, have ultimately succumbed to the disease. Mr. Kettle, of Market Drayton, tells me that he was seven years in a large cattle practice in Devon, where the climate is mild and humid, and never saw a single case; whereas, in Shropshire, where the atmosphere is, as a rule, cold and dry, and in many places the soil of a clayey character, he has seen many cases. The latter part of the statement I can fully confirm. West Derby, in Lancashire, is notorious for its number of cases of consumption in the human subject. M. Wanner (see *Lancet*, June 10th, 1848) states his belief that phthisis is due to the abundance of calcareous matter in the soil (in this I cannot entirely agree with him), for in one part of France, viz. Sologne, in the Orleannais province, where the soil is devoid of such material, no tubercle exists, and in another part of the same district, where the soil is rich in calcareous matter, tubercle is very prevalent. Heavy drain upon the system by excessive or prolonged lactation, and at the same time, adopting the pernicious system of feeding upon brewers' grains or chaff, thus lowering the vital forces, so that if an exudate is thrown out, or a tubercle germ is formed in or accidentally gains access to the body, healthy organisation does not take place, or the system cannot prevent the further development or multiplication of the germ or germs: disease of the digestive organs giving rise to impaired nutrition from inability to convert the food into an easily assimilable material, coupled with loss of appetite, though this may be secondary from deposition of tubercular matter in juxtaposition to the plexuses and ganglia formed by the sympathetic and pneumogastric nerves, or the peripheries of those nerves.

The supply of large quantities of artificial foods, or the too free use of certain artificial manures, this accounting somewhat for the fact that, in spite of improved drainage and breeding, the disease exists to quite as great (if not considerably greater) an extent as it ever did. Diseased condition of the blood, decom-

posing food, noxious exhalations, bad weather, may each be classed as exciting causes.

Another very remote cause, and, perhaps, you will say it is very remote, I must mention is this: — Animals suffering from intestinal and hepatic tubercle, especially rabbits, which are constantly running over pastures, must necessarily pass with the fæces a large quantity of tubercular matter in various stages of development and degeneration; may not this be picked up with the grass, and small portions of it become lodged in accidental wounds or abrasions of the mouth or throat, especially as we know that such abrasions and wounds do frequently exist in these situations, and thus by direct inoculation propagate the disease?

Prevention of Tubercle.—Proper feeding, proper housing, careful selection of sires and dams, avoidance of all debilitating causes and adulterated or decomposing food, the fattening, if possible, or slaughter of animals known to be affected with the disease; and here I would say that there are few animals the subject of tubercle which ought to be used for human food, no matter what the monetary loss may be upon such animals; and more particularly than all these, should lands that are known to be productive of tubercle be properly drained and carefully manured. Various transformations and combinations of elements are constantly going on in such lands, and it is reasonable to suppose that even the elements of tubercular matter may be generated in such soils equally as much as the exhalations which give rise to the various fevers whose occurrence or prevalence is always associated with some peculiarity of climate and soil. If this view approaches to even an approximation of the truth, surely it were wise to adopt precautionary measures, and, as in the early spring, in wet humid seasons succeeding a wet summer and autumn and a mild winter, we should have recourse to a top dressing of salt or sulphur on land favorable to the development of *Filaria bronchialis* (and it is my opinion that the transformation, either directly or indirectly, of these parasites will ultimately be found to go on in the autumn and early spring months in favorable seasons and soils), so we should apply disinfecting and antiseptic manures, such as carbolic acid mixed with lime or sawdust, salt, or sulphate of iron, to lands that are known to be favorable to the development or production of tubercle or allied affections.

Having thus far, gentlemen, occupied your time, I shall draw my paper to a close by various discursory remarks on the subject of tubercle. I presume it is quite unnecessary for me to enter into the symptoms of pulmonary phthisis in cows, as I doubt not you are all well acquainted with them, and the treatment of such cases, as a rule, is utterly hopeless, as we are not called in until

the disease is tolerably far advanced. In dogs, however, the case is different; we are expected to treat them, as they are the creatures more frequently of affection than of pecuniary interest. In these animals we, probably, more often find cutaneous tubercular ulcer in connection with the glands of the throat than in any other; and in treating these ulcers several measures may be had recourse to; if it can be done without danger, excision is the readiest and surest remedy, if not, scarifying the edges of the ulcer, and applying carbolic pads and bandages will frequently heal them, at the same time administering such catalytics as iron, arsenic, or iodine, either separately or alternately, with raw eggs, raw meat, as tripe, and cod-liver oil. A word or two, in passing, as to the action of the last-mentioned agent in this disease. Fat, we know, is the molecular base of chyle; it is also the basis of muscular tissue, independent of its being an element of respiration; and it is in these ways, coupled with its easily assimilable nature, that it has been thought to act beneficially in tubercle. Several circumstances that have come under my notice have led me to a somewhat different conclusion (it would be premature of me to state these circumstauces until I am in a position to speak more definitely in the matter), viz., that the particles of fat surround the particles of tubercular matter in the system, and render them innocuous. Another very beneficial action of cod-liver oil is as a restorative of the suppressed sebaceous secretion of the skin. I have seen the skins of animals to which it has been administered change very rapidly from a harsh, dry condition to one of sleekness and health, protecting, also, the body from the vicissitudes and injurious influences of the atmosphere. With cod-liver oil glycerine should be given, as also alcohol, in some shape, being not only elements of respiration, but preservatives of tissue. Small doses of carbolic acid may also be given with benefit in conjunction with oil, the bowels well attended to, the skin kept clean, and gentle exercise allowed. One symptom I should mention in dogs in chronic tuberculosis (though, perhaps, you will say it is an accompaniment of all debilitating diseases; nevertheless, I have seen it in this affection in other animals than the dog), is depilation. If the liver is the seat of tubercle, accompanied with enlargement and hardening, it can be readily detected by manipulation, yellow mucous membranes, livid and yellow appearance of the skin, and ascites of the abdomen. In these cases, of course, treatment is hopeless.

The salivary glands and the pancreas are not prone to tuberculous transformations, neither is the brain the frequent seat of the same in the lower animals. Solitary cerebral tumours are occasionally found in the substance of the brain, and I believe that some of the tumours we find in the lateral ventricles are conglomerations

of small miliary or granular tubercles, as I have on one or two occasions found such growths on the edges of the plexus choroides. Depositions on the meningis of the brain are more often met with, one interesting case of which in a calf was brought to the college last winter by Mr. Borthwick, V.S., of Kirkliston. The animal was brought in a cart on November 15th, being paralysed and unable to lift its head, or make any attempt to rise. Mr. Borthwick could glean nothing of the history of the case prior to the 14th November, on which day he was requested to examine it, when he found symptoms of cerebral disturbance, the most prominent being a constant tendency to turn round to the right side; the appetite was bad, but the animal was in fair condition. No treatment was had recourse to as the case was considered hopeless. I should add that the sturk was perfectly conscious, and the appearance of the eyes natural; if anything, the pupils were slightly dilated. It was killed, and a *post-mortem* made on the 16th, which revealed extensive tubercular growths of various sizes on the whole of the thoracic and abdominal serous membrane. On opening the cranial cavity the superior surface of the dura mater was perfectly healthy, but on removing the brain about two ounces of a dirty yellow coloured fluid was found at the base, and the whole of the membranes thickly bestudded with small granular tubercles. No inflammatory action or exudations could be detected, the serum no doubt being the product of effusion from pressure on the blood-vessels, as the result probably of congestion. In this way, *i. e.* congestion, hydrocephalus may be produced in very young animals, as well as by the effusion of serum the result of inflammatory action set up by the presence of the tuberculous matter. In these cases we may also have plastic lymph effused and healthy organisation, side by side with the tubercular formations.

Tubercle in Bones, and in joints and synovial membranes, is not so frequently found as in the human subject. Nevertheless, well-marked cases are sometimes seen, and it behoves us to be prepared for them, especially when we have chronic swellings of joints accompanied with emaciation of the nature of which we cannot satisfy ourselves. Personally, I have only seen one satisfactory case of tubercle in joints or bone, a report of which you will find in the *Veterinarian,* January, 1864, pp. 30 and 31. A good specimen in the elbow-joint of a cow is in the College Museum, preserved by Professor Williams.

Tubercle may affect the external surface of bones deposited underneath or within the periosteum, seldom, however, finding its way thence into the compact structure. It may also affect the bodies of the vertebræ, and in the human subject this is often found to be the case. It may be deposited in the cancellated structure at the

extremities of long bones, degenerate, give rise to absorption of the cartilage, and empty itself into the cavity of the joint. In these cases the synovial membrane becomes effected, no synovia is secreted, attrition of the extremities of the bones, as in the case alluded to above, and absorption takes place: occasionally, however, nature make a desperate effort to preserve the articulation by depositing a porcellaneous substance, as shown in Professor Williams' specimen, on the articular surfaces. Sometimes the tubercular matter is enclosed in a callous cyst in the interior of a bone, at other times it increases in size to such an extent as to cause a bulging of the compact structure of the bone, in which also tubercular matter is infiltrated, and ultimately a channel is formed, by necrosis, communicating with the medullary canal, and producing externally a chronic sinuous ulcer, defying in some instances surgical science to heal. After the evacuation of tubercular products the medullary canal is said by some authorities to become filled with a gelatinous-like substance, the true medullary matter not at all times being again restored. Ossific deposits are also found at the extremities of bones entering into the composition of tubercular joints, as the result of inflammatory action.

In conclusion, Mr. President and Gentlemen, allow me to express a hope that, in the pages I have just read, some idea may have been dropped, which, falling upon good ground, will bring forth fruit a hundredfold. I trust that such may be the case to-day; and as I have freely expressed my opinions you will do the same whether you agree with me or not.

After the reading of the essay, *Mr. McLean,* in thanking Mr. Walley, remarked that the meeting would certainly agree with him in saying that the thesis, besides being based on sound theory, was replete with practical observations. Indeed, the subject had been most elaborately handled by the author.

At the desire of the Association, the Secretary received instructions for the essay to be forwarded to the Editors of the *Veterinarian* for publication.

Professor Walley invited discussion on his essay, remarking that he had never yet attended a scientific gathering such as this without being, himself, much edified and instructed.

Professor Fordie, in his criticism, said:—I think it is a mistake to dwell so long and give so much attention to the production of tuberculosis, and to overlook the diathesis of the disease. Tuberculosis in man bears no relation to that of the lower animals, and especially to the disease of the bovine species. The different appellations given to it in the human subject, as decline, consumption, &c., might be regarded by many persons as the

same disease as tuberculosis in the bovine race; but in his opinion they bore no relation. In the human subject consumption is more fatal and is more common in young persons than in adults. Observations prove that children are predisposed to the disease, but cattle tuberculosis does not so much depend upon the condition of the body to tubercular deposit. He—Mr. Fordie—had observed these deposits to be frequent in plethoric animals, as well as in poor or lean-cattle. He was convinced of the fact by selecting and slaughtering a herd of stall-fed animals apparently in perfect health, but in which tubercles were, to his surprise, present to a great extent. The peritoneum is generally involved. He might say it was both an interesting and important question to solve, namely, whether or not tuberculosis is malignant or non-malignant in its nature. If we admit consumption in the human subject to be similar to tuberculosis in cattle, we cannot deny its malignancy; but I hold—he remarked—that it is not malignant to the same extent. National benefit would result by proving the disease to be non-malignant, especially when butchers' meat is so high in price, as thousands of animals would be saved annually for human food. If melanosis of the horse and tubercle of man be examined under the microscope, there is physically no difference. The consequences, however, are very different. In the horse melanosis is not fatal; in man it is very fatal, and in man also most malignant. When it proves fatal in the horse, Mr. Fordie was of opinion that death took place by mechanical pressure on a vital part.

Mr. Wm. Anderson. — Melanosis is a disease which very often presents itself in the liver and other internal organs, besides affecting the skin; although the most common seat of the disease is underneath the tail. In his opinion, whenever situated externally, there will be a great probability of melanosis being deposited internally as well.

Professor Williams.—From microscopical investigations made by some of the most eminent physiologists in Glasgow and Edinburgh of melanotic tumours which I had removed I look upon melanosis as a form of cancer. To me the structure resembled cancer; in one case thirty-five pounds were removed. The disease may, therefore, be said to be malignant, and to attack all kinds of structure, one or all at the same time. We must look on cancer in the lower animals to be almost identical with cancer in the human being, the principal difference being that cancer in the human subject speedily takes on the process of softening, whereas in the lower animals this does not so frequently occur. So long as it forms and does not interfere with any vital spot, it is looked upon as an excreted material.

Mr. W. Anderson.—I can give you an instance of a case of

disease of the lungs of a horse, produced, in my opinion, through pyæmia, in connection with suppuration going on in the bones of the head, as the turbinated, &c. The animal in question was the property of a Mr. Finlay, near Glasgow. On making a post-mortem examination, the liver, bowels, &c., were found to be in a perfect condition; but on examining the lungs a few tubercles presented themselves on each. The frontal sinuses were filled with pus, and there was disease of the turbinated bones.

After some discussion on pleural adhesions and other diseases, the meeting adjourned. At the next meeting of the Society, which will be duly advertised in the *Veterinarian*, the subject of tuberculosis will be further discussed.

James Anderson, *Hon. Sec.*

ADDENDUM.

The following details of two cases of fractured ribs, accompanied with serious complications, have been supplied by Professor Walley. They were brought before the meeting of the West of Scotland Association.

Case 1.—*Laceration of the walls of the right ventricle of the heart and of the pericardium; fracture of the fourth rib; hypertrophy of the left ventricle and secondary phlebitis.*

Subject.—A dark brown gelding, about fifteen hands high, eight years old, the property of a baker.

Admitted May 20th, in an apparent state of collapse, having received a wound from the shaft of a milk cart, about eight or nine inches long by four wide, on the right side. The shaft had penetrated at a point a little above the line of the elbow-joint, passed under the shoulder, and fractured the fourth rib about two inches from its junction with the costal cartilage. The pulse was indistinct; breathing laboured and irregular; expression of countenance anxious; mucous membranes not much blanched, showing the absence of hæmorrhage; as the animal breathed the atmospheric air, heated in the thoracic cavity, could be seen puffing out of the wound at each inspiration. Auscultation over right side gave evidence of dulness in the respiratory murmur. The sounds of the heart were indistinct and fluttering.

Diagnosis.—Fracture of a rib and collapse from shock, and probably injury to the lungs.

Prognosis.—Very unfavorable. Recommended the owner to destroy the animal, but he would not consent, as he intended to have recourse to legal proceedings to recover his value; feeling assured that treatment would be of no avail the wound was

simply plugged with tow saturated in carbolic liniment, to prevent the ingress of the atmosphere. About two hours after admittance the animal appeared to have rallied so much that we thought there might be a possible chance of his recovery. Administered Ammon. Carb. ʒiv in bolus, and applied a strong stimulant to the region of the thorax, on either side. The Ammon. Carb. was repeated as often as it was thought necessary. soft food allowed, with an occasional dose of Ol. Lini as an aperient, the wound attended to, and the animal kept as quiet as possible. Contrary to expectation but very little pleurisy supervened, the appetite remained good, the pulse became natural at the end of the second day and remained so; and the wound progressed favorably towards healing.

June 6th.—Animal sent home with injunctions to bring him to the college every second day to have the wound attended to, as it had now become so much like a small sinus that fears were entertained of its ultimately developing into a fistula. Between the 6th and the 18th he was only brought in two or three times. On the latter date it was observed that he had become much thinner; the mucous membranes were pallid; the breathing hurried; pulse irregular but not much quickened. Considerable œdema of the sheath was present with great stiffness of both hind legs, and soreness when made to move. A straw-coloured serum was flowing from the wound, but on auscultation no indications of any serious mischief going on in the pleura could be detected, although a suspicion was entertained that the fluid which escaped from the wound was secreted by that membrane and found its way through the aperture in the rib as quickly as formed. Our prognosis was now more unfavorable than before, and we came to the conclusion that the pericardium was also involved in the mischief.

19th.—On auscultation over the cardiac region I found that the heart was beating violently against the side, not palpitating, but with a regular, steady, dead thump, giving an impetus to the intercostal muscles at each beat, and the pulse 56. This action I attributed to hypertrophy, and with a view of relieving it and removing the swollen condition of the sheath, I ordered Pulv. Digitalis ʒiss, Pot. Carb. ʒiij in ball, repeating the dose the following morning, with the effect of steadying the action of the heart, reducing its beats to 48, and giving much relief to the animal. No further treatment was had recourse to, and on the 22nd he was destroyed.

Autopsy.—On laying bare the seat of injury the fractured rib was discovered, its broken ends having undergone false unition. An aperture existed in the centre of this false unition, surrounded by a crop of granulations internally, which had the effect of

plugging it, thus preventing the exit of more serum, the flow of which had been noticed to stay a few days before the animal's death. The external aperture was about the size of an ordinary goose-quill. The ribs were then carefully divided as close as possible to the spine and reflected, showing, to our astonishment, the pericardium adherent (all round and below the seat of injury) to the rib. The heart and pericardium were removed with the ribs for further exaamination.

The pleura bore traces of inflammatory action, with slight adhesions scattered at intervals over its surface. A small quantity of water was present in the thorax, but very little in the pericardial sac.

The sheath was laid open on either side, revealing extensive phlebitis, the whole of the vessels being enlarged in calibre and plugged with lymph, which in some instances was degenerating into *phlebitic pus*. A large abscess, containing similar pus, also existed, the formation of which, from the extreme pain on pressure, had been anticipated a few days prior to the death of the animal. On carefully examining the lungs, Professor Williams discovered phlebitis to a slight extent in the right lobe. Further examination of the heart and pericardial sac brought to light the fact that the shaft had not only penetrated the pericardium, but also the right ventricle of the heart, inflicting a wound in the latter about an inch and a half long, and about half its original thickness in depth. The wound had cicatrized, its edges, which were hard and fibrous, having the parietal layer of the pericardium adherent through their whole extent. This layer of the pericardium was also adherent to the heart for some distance below the wound, the external walls of the ventricle being ecchymosed. Considerable *simple hypertrophy* of the left ventricle, and *eccentric hypertrophy* of the right auricle, with great fibrous thickening of the pericardium covering the latter, also existed.

Case 2.—*Traumatic hydrothorax; pulmonic abscess, and fracture of the third and fourth ribs.*

Subject.—A gray carriage horse in good condition, seven years old.

History.—About 5 p.m. on the 25th November, 1870, the shaft of a butcher's cart, which was being driven at a tolerably rapid pace, came in contact with the right breast of the horse, penetrating to the depth of eight or nine inches. The wound, which was situated a little to the right of the cariniform cartilage, on being examined was found to be about four inches in width, by about eight or nine inches in depth, at least so far as could be ascertained, but as the animal moved very stiffly, I expressed a doubt that the shaft had penetrated the chest, the internal orifice

closing up on the withdrawal of it. Every attention was given to the injury; the wound suppurated, and all appeared to be progressing favorably, with the exception of the advent of a few feverish symptoms, up to the 5th of December, when the attendant noticed an abundant discharge of serum underneath the anterior part of the thorax, but as there was considerable œdema of the parts, little attention was paid to it.

7th December.—The animal refused his food, and was very dull and anxious all day. In the evening his pulse was 76, weak, and irregular; respiration 30, and laboured. On examining the wound, a copious flow of serum of a yellowish colour was observed, which, running down the arm and under the chest, had produced excoriation of the skin. Coupling this symptom with the state of the pulse and respiration, I was led to the belief that hydrothorax existed, and that the wound was acting as an outlet for the discharge of the serum. Auscultation and percussion of the right side gave evidence of nothing more than increase in the respiratory murmur, as though the lung had above its ordinary share of work to perform. In the lower half of the left lung no sound, except the beat of the heart (which had the peculiar resonance indicative of the presence of fluid), was distinguishable; pressure applied to the left side caused the animal to evince much pain, and to give utterance to an expressive grunt. Add to these symptoms a short, painful, and suppressed cough, and I think I was quite justified in arriving at the conclusion that the shaft had penetrated the left pleural sac, thus producing pleurisy, followed by effusion.

Treatment.—Had mustard poultices applied to the sides; ordered the wound to be kept open, and gave Ammon. Carb., with ale and whiskey every eight hours.

8th, 10 a.m.—Great improvement was manifested; pulse 64, and stronger; respiration 20, and much easier; had eaten a little, and the anxious expression had disappeared from his countenance. The mustard had produced a good effect, and upon auscultation I found that the right lung was performing its office with greater ease, and the murmur on the left side could be heard to within a third of the depth of the thorax from below; the wound was still discharging serum very copiously, a small quantity of which submitted to heat, quickly coagulated. The mustard poultices were repeated to the sides, the administration of the stimulants with the addition of raw eggs continued, and the animal allowed anything he would eat. In the evening he was still improving, the discharge lessening, and the pulse reduced to 60; a little more mustard was applied to the chest, and afterwards hot cloths; internal treatment as before.

From this date I had no opportunity of seeing the horse until

the 16th, but such treatment as was deemed requisite had been carried out. On the 16th I found the animal much worse; pulse 72, weak, and irregular; body much emaciated; appetite very indifferent; respiration distinctly characteristic of hydrothorax; and mucous membranes injected. The wound showed a great tendency to close up, and the discharge had become sero-purulent, but sometimes the serum would flow quite clear; the pectoralis anticus on the near side was quite absorbed, and on auscultation distinct crepitus and gurgling could be heard on the off side of the chest to the half of its depth, and on the near side the respiratory murmur could be distinguished, but it was of a character indicative of air being driven through the bronchial tubes in opposition to some obstructing force. The treatment now consisted of stimulants, tonics (both vegetable and mineral), with oatmeal gruel *ad libitum*. I should mention that the attendant had noticed a great deal of borborigmus with the constant expulsion of gas per anum, and that the animal alternately extended his fore legs or rested on his toe.

20th.—Animal lay down for a considerable time, and, with the exception of difficult respiration, evinced no inconvenience in the recumbent position: the following day he appeared much relieved, and continued to improve up to the 24th, when the discharge ceased; the wound was apparently closed, and the appetite improving.

26th.—The discharge, which was now of the consistence and colour of cream from the admixture of pus—no doubt from an abscess in the course of the wound—reappeared, and the pulse rose to 72, but the animal continued to lie down comfortably, and his appetite remained good. The respiration still presented the peculiar action of hydrothorax, but not quite in so great a degree as previously. The wound, which was about eight inches in depth, was injected with acetate of zinc lotion.

27th.—Animal worse; respiration much laboured, the muscles of the stifle being brought into play in each expiratory movement; a copious discharge of laudable pus mixed with serum from the wound; body much emaciated, and expression of countenance anxious and heavy. Auscultation over right side failed to detect the slightest respiratory murmur, but a distinct gurgling of fluid was discernible with each movement of the ribs, and on percussion in ever so slight a degree the patient evinced great pain. On the right side the respiratory murmur could be distinguished in the upper half of the lung, and with it distinct crepitus, as also gurgling in the lower half; one or two patches also showed a marked increase of temperature.

29th.—Animal destroyed, as no improvement was manifested.

Autopsy.—On tracing the wound along its course, it was

found formed into a sinus, following the direction of the penetration of the shaft, which had passed over the superior border of the cariniform cartilage, and between the first and second ribs on the right side fracturing the third and fourth ribs on the left, about three inches from their lower extremities, and entering the lung on the same side, giving rise to the formation of an abscess, a large quantity of pus still being retained in its cavity. There was effusion of serum, mixed with flakes of lymph, into the thoracic cavity, with considerable adhesions, the wound in the chest, acting as a drain, prevented the accumulation of much serum. One gentleman, who saw the animal during life, stated his opinion that fracture of a rib probably existed, but as it was immediately covered by the shoulder, a correct diagnosis on this point was difficult.

The shaft was curved downwards at the end, the pony which was in the vehicle being about twelve, the horse sixteen hands high.

Remarks.—Both these cases illustrate the absurdity of supposing that ingress of air into the chest produces collapse of the lungs. No. 1, as was remarked at the autopsy by Professor Williams and myself, and during the discussion by the former, shows to what an extent the heart may be injured and its integrity destroyed without a fatal result. The phlebitis of the sheath must have been secondary, and may have followed the occlusion (by detached portions of thrombi from the walls of the heart) of some of the small arteries in the neighbourhood; the pulmonic phlebitis was evidently a subsequent condition to that in the sheath. The diseased condition of the vessels of the sheath was thought by Professor Williams to be due to pyæmia from the absorption of decomposing pus from the original wound, the decomposition being brought about by exposure of the pus to atmospheric air. On consideration, I can scarcely agree with this view of the case, as in the first place the abscess in the sheath did not present the usual appearances of pyæmic abscesses; and, secondly, the animal's appetite remained good, the pulse comparatively quiet, and the temperature normal.

One remarkable thing in the history of No. 2 is worthy of observation, viz. the ease with which the animal assumed the recumbent posture, though this is not the first time I have seen an animal do this with hydrothorax, and probably in this case the small amount of fluid in the chest, owing to the artificial drain through the wound, may supply the reason.

ORDERS OF COUNCIL.

REVOCATION OF ORDER ALLOWING FREE MOVEMENT TO SCHLESWIG-HOLSTEIN CATTLE.

At the Council Chamber, Whitehall, the 31st day of July, 1872. By the Lords of Her Majesty's Most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1869, and of every other power enabling them in this behalf, do hereby revoke the Schleswig and Holstein Cattle Order of July 4th, 1872: provided that nothing herein shall invalidate or make unlawful anything done under the said Order before this Order takes effect, or interfere with the institution or prosecution of any proceeding in respect of any offence committed against, or any penalty incurred under, the said Order.

(Signed) Arthur Helps.

SLAUGHTER OF GERMAN SHEEP AND GOATS.

At the Council Chamber, Whitehall, the 31st day of July, 1872. By the Lords of Her Majesty's Most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under the Contagious Diseases (Animals) Act, 1869 (in this Order referred to as the Act of 1869), and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:

Subject to the provisions contained in the Orders of Council relating to the ports of Granton and Leith, dated the tenth day of August, one thousand eight hundred and sixty-nine, and in the Order of Council relating to the port of Southampton, dated the first day of October, one thousand eight hundred and seventy, all the regulations in the Fourth Schedule to the Act of 1869 shall apply to sheep and goats brought to Great Britain from any place in the Empire of Germany, and landed in Great Britain, and all such sheep and goats shall be slaughtered within ten days after the landing thereof, exclusive of the day of landing.

(Signed) Arthur Helps.

REMOVAL OF THE RESTRICTIONS UPON FRENCH CATTLE, SHEEP, AND GOATS.

At the Council Chamber, Whitehall, the 6th day of August, 1872. By the Lords of Her Majesty's most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under The Contagious Diseases (Animals) Act, 1869, (in this Order referred to as the Act of 1869), and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:

1. This Order shall take effect from and immediately after the thirteenth day of August, one thousand eight hundred and seventy-two; and words in this Order have the same meaning as in the Act of 1869.

2. The Order bearing date the eighth day of December, one thousand eight hundred and seventy-one, prohibiting the landing in Great Britain of cattle, manure, and hay, and regulating the landing in Great Britain of sheep, goats, and certain articles brought from any place in Belgium or France (which Order has already been revoked as far as the same related to cattle, sheep, and goats brought from any place in Belgium), is hereby further revoked as far as such Order relates to cattle, sheep, and goats brought from any place in France.

3. The Second Schedule to the Foreign Animals Order of 1871 shall be read and have effect as if France was included in the list of countries therein named.

4. Nothing in this Order shall invalidate or make unlawful anything done under the said Order of the eighth day of December, one thousand eight hundred and seventy-one, before this Order takes effect, or interfere with the institution or prosecution of any proceeding in respect of any offence committed against, or any penalty incurred under, the Act of 1869, or the said Order of the eighth day of December, one thousand eight hundred and seventy-one.

(Signed) Arthur Helps.

CLEANSING AND DISINFECTING MARKETS.

At the Council Chamber, Whitehall, the 8th day of August, 1872, by the Lords of Her Majesty's most Honorable Privy Council. Present—Lord President, Mr. Forster.

The Lords and others of Her Majesty's most Honorable Privy

Council, by virtue and in exercise of the powers in them vested under The Contagious Diseases (Animals) Act, 1869 (in this Order referred to as the Act of 1869), and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :—

1. This Order may be cited as the Markets Order of 1872.

2. This Order extends to Great Britain only.

3. Words in this Order have the same meaning as in the Act of 1869.

4. Every Local Authority is hereby empowered to make from time to time, with the view of preventing the spreading of contagious or infectious disease among animals, regulations for the following purposes, or any of them :—

(1) For requiring the owners, lessees, or occupiers of places used for the holding of markets, fairs, exhibitions, or sales of animals, or for the lairage of animals, to cleanse those places from time to time at their own expense :

(2) For requiring the owners, lessees, or occupiers of those places to disinfect the same, or any specified part thereof, from time to time at their own expense, where, in the judgment of the Local Authority, the circumstances are such as to allow of such disinfection being reasonably required :

(3) For prescribing the mode in which such cleansing and such disinfection shall be effected.

5. Notwithstanding anything in The Animals Order of 1871, Article 39 of that Order shall not apply to the cleansing and disinfecting of any such place as aforesaid.

6. If the owner, lessee, or occupier of any such place as aforesaid does any act in contravention of the regulations of a Local Authority under this Order, or fails in any respect to observe the same, it shall not be lawful for him or any other person at any time thereafter, until further Order of the Privy Council, to hold a market, fair, exhibition or sale of animals in that place, and the holding therein of any market, fair, exhibition, or sale of animals shall be and the same is hereby prohibited accordingly, and if any person holds any market, fair, exhibition, or sale of animals in contravention of this Order, he shall be deemed guilty of an offence against this Order.

(Signed) ARTHUR HELPS.

PARLIAMENTARY INTELLIGENCE.

CATTLE PLAGUE.

HOUSE OF COMMONS, THURSDAY, *July 25th.*

Mr. Dent asked the Vice-President of the Council whether it was true that a case of cattle plague had occurred in a cargo of Russian cattle imported into Newcastle from Hamburg: and whether he had taken any steps to prevent the importation of Russian cattle into the country through German ports, in addition to forbidding the direct import from Russia.

Mr. Forster was sorry to say that in addition to the case referred to in the question of the hon. gentleman a Hamburg steamer had brought in on Monday morning seventy-eight cattle, seven of which were German and eight Russian breed. One of the Russian cattle was very ill on the arrival of the steamer, and died a few hours afterwards, from what he believed to be undoubted cattle plague. The captain acknowledged that he had thrown a cow overboard which had died of the plague six hours after being taken on board. On Monday or Tuesday the Government was informed that a cargo of cattle from Cronstadt to London was attacked by the plague. They also had reason to believe that another cargo of cattle from the same place to Hull would arrive in the course of a few days. Every possible precaution had been taken, and he was happy to say that Professor Simonds, Principal of the Veterinary College, had kindly consented to place his services to the Government. The Government had forbidden the importation of cattle from Russia, but the cargoes which were diseased had been shipped before the order in council could take effect. It being a serious thing to interfere with the importation of German cattle, he thought it his duty to communicate officially to the Prussian Embassy. He had thought it his duty at once to communicate with the North German Embassy, which had sent a telegram to Germany to inquire into the matter, and he had no doubt whatever that effectual steps would be taken to prevent any of those Russian cattle from coming here in German ships. He trusted that that would be sufficient; but if it were not, the Government would be forced to consider whether they should prohibit importation or not. He thought what he had said would convince hon. members of the absolute necessity which there was of providing for the slaughter of all German cattle at the port of landing, unless there were sufficient proof that they did not come from a Russian port. But for that order he did not see how they could possibly have prevented the cattle plague from being now in the northern counties.

Colonel W. Patten asked whether the cattle plague had broken out in any of the Mediterranean ports.

Mr. Forster said they had no information; but those ports were included in the schedule, and cattle coming from them would be slaughtered at the port of landing. They had information that the cattle plague was very bad on the Polish frontier.

In reply to Mr. Dent,

Mr. Forster said that whether cattle were slaughtered at the port of landing or taken out to sea must depend on the circumstances of the port. At Hull, as he understood, they were slaughtered on board; but at Newcastle they were landed and slaughtered.

July 30th.

Lord Elcho wished to put a question to the Vice-President of the Privy Conncil respecting the carcases and offal of animals which had died of the cattle plague and which had been washed ashore on the coast of his county. He had received a letter that morning from Sir Hugh Dalrymple, the convener of the county of Haddington, stating that since Saturday last forty pieces of entrails and four carcases had been washed ashore, and stating that as the cattle at this particular season of the year went down to the sea-coast great danger was apprehended from disease. He (Lord Elcho) therefore wished to know what the Government intended to do in the matter, and whether they intended to take any steps to prevent such a great danger.

Mr. Forster said that the Government had done all that they possibly could. They had warned the local authorities of the danger, and had informed them of the provisions of the Act. Although Government was not compelled to do so, it had sent down to the north-east coast two of their best inspectors, Professors Simonds and Brown, to assist the local authorities. He had been informed that three cargoes of cattle, more or less diseased, had arrived at Newcastle, Leith, and Hull. At Newcastle the inspectors succeeded in destroying the animals without difficulty, but at Leith and Hull he experienced difficulty in getting the animals destroyed and also in burying them. The local authorities undertook to send them out to sea, and had informed the Government that they had taken every precaution to have them sunk. If the authorities had neglected to take the necessary precautions, all he could say was that he deeply regretted the circumstance, and he was very glad that the noble lord had asked his question. Professor Simonds was taking every means to warn the police to guard against animals coming on shore. He had only that moment heard of a cargo of animals coming into Deptford, some of which had been thrown overboard on the high seas. The Government could not hinder animals being thrown overboard on the high seas, although it was very wrong of the captains to do so. There might be danger, he thought, arise from these animals being washed ashore on the coast of Essex, and therefore he had telegraphed to the local authorities to take all precautions to guard against such a danger. He might mention that there seemed to be a most extraordinary out-

break of cattle plague in the East. Indeed every vessel with cattle coming from Russia seemed to have the disease on board. The import of cattle from that country would be entirely stopped in a day or two.

Sir J. Hay wished to know whether there were any precautions taken for disinfecting the ships which had carried diseased cattle.

Mr. Forster said that the greatest possible care was always taken to disinfect such ships, and for three months after they had carried a diseased cargo they were prohibited from carrying cattle from free countries, and he had every reason to believe that they would not be again used even so soon as that.

In reply to a question from Mr. Newdegate,

Mr. Forster said that he did not know the exact details in connection with the way in which the ships and animals were treated at Leith, but he supposed that they were treated in a similar manner to those at Hull, namely, that the animals, after having been slaughtered, were all put on board a lighter and towed out into the sea and sunk; therefore, there was no occasion to disinfect that ship. (Laughter.)

July 31*st*.

Mr. C. S. Read asked the Vice-President of the Council if there had been a further outbreak of cattle plague at Hartlepool; whether the cattle affected came from Hamburg *viâ* Lubeck; and whether, considering the close proximity of those towns to Holstein, he would revoke the recent order which permits cattle from Holstein to be taken to any part of the kingdom.

Mr. Forster said it would give a false impression to say that there had been an outbreak of cattle plague at Hartlepool. That would produce an impression that there had been an outbreak amongst English cattle, whereas as yet they had prevented that, and he trusted they would be able to do so in future. It was true that there had been importations of cattle from Hamburg, in which some of the animals had cattle plague; and he was sorry to say that that had been the case also with respect to cattle imported at Newcastle within a day or two. With regard to the disposal of animals affected, or of the whole cargo, the greatest possible precautions had been taken, and Hartlepool as well as Leith presented very great obstacles to the burying of animals within a defined place; but Professor Simonds was there at that moment, and he, no doubt, was giving the authorities the best advice that he could. Upon the question "whether the cattle affected came from Hamburg *viâ* Lubeck," he could not give any positive information. As the gentleman was aware, it was very difficult to ascertain from persons abroad any fact which they did not like to communicate. The Government had reason to suspect that cattle had been imported from Cronstadt to Lubeck, then sent a short journey by railway, and afterwards shipped at Hamburg. He had communicated instantly with the North German Embassy on that matter, and just before coming down to the House he received a letter from the

chargé d'affaires, in which he informed him that he had received a telegram from Berlin, stating that steps were about to be taken by the Senate at Lubeck to prohibit the import and transit of Russian cattle, hides, &c. The last question was an important one, and was occupying his close and constant attention, but he could not give any definite answer. On the one hand, he did not deny that there appeared to be danger on account of the neighbourhood of Hamburg to Schleswig Holstein; but, on the other, they must remember the high price of meat, and not allow themselves, through any unreasonable fear, to increase that price. (Hear, hear.) It was a most serious matter to interfere with the importation from Schleswig-Holstein at that moment. He found that during the last three weeks the number of cattle imported into Great Britain from Germany was 5103, of which 3576 came from Schleswig-Holstein, and were brought to the port of London. The import would be very seriously affected by the cancelling of the order to which the hon. member referred. It would not be done unless it were necessary, but in that case it must be done. He would just inform the House what the conditions of that importation were. Before the Order in Council was issued no cattle could be imported from any part of Germany without being slaughtered at the port of landing; Schleswig-Holstein had, so far as they knew, always been safe from the cattle plague; and there was a strong desire that cattle should be imported, which appeared to have been thus far remarkably healthy. For a long time the Government refused to allow the import of Schleswig-Holstein cattle, unless they were secured against getting no others; and the security afforded was that the importer was under a bond of £1000 not to import any other cattle, and that there was a Government certificate stating that the vessel had not within three months had on board any cattle from any part of the German Empire other than Schleswig-Holstein, or from any scheduled country, and had not entered any of the scheduled ports, and that none of the cattle imported had come in contact with cattle open to that objection. That, he conceived, constituted sufficient security except for the danger arising from the proximity of Schleswig-Holstein to Hamburg. For many months Lord Ripon and himself had very strong pressure put upon them to admit all cattle that came from Germany into the interior of this country, and he trusted that those persons, both in the House and out of it, who pressed for that relaxation would see that if their wish had been acceded to, it would have been very difficult to prevent the cattle plague from being spread all over the country. (Hear.)

In reply to Lord Elcho,

Mr. Forster said it was difficult to explain how it was the carcases of cattle had got into the sea near Leith. On the previous evening he saw Professor Brown, who had just returned from the north, and though that gentleman agreed with him that such a thing ought not to have occurred, he also satisfied him that such precautions were taken for secure burial that there was not much cause for apprehension with regard to the carcases in question.

In reply to Mr. Peel,

Mr. Forster stated that since replying to the member for Norfolk in the early part of the day he had ascertained that of the three cargoes which came in from Hamburg with cattle plague, in two of them at least the cattle plague was found amongst German cattle, and, so far as he could discover, there were no Russian cattle in the same ships. He was obliged to come to the conclusion, therefore, that cattle plague must exist at Hamburg, and under the circumstances the Government had to consider whether they would allow the order to remain in force which allowed Schleswig-Holstein cattle to come in without being slaughtered at the port of landing. With cattle plague at Hamburg, Schleswig-Holstein could not be considered safe, and therefore it had been most reluctantly thought necessary to cancel the order, and also to schedule sheep from Germany, obliging them to be slaughtered at the port of landing. The position of Schleswig-Holstein, therefore, would be what it was a month or two ago, and all German cattle and sheep would have to be slaughtered at the port of landing. Hitherto the practice had been to prohibit the import of cattle from ports where the disease existed, but he hoped measures would be taken by Germany for speedily stamping out the disease, so that there would be no necessity for taking a course which would be a great inconvenience to the trade. He must, however, observe that restrictions upon the trade did not affect the price of meat so much as the existence of cattle plague. (Hear, hear.)

THURSDAY, *August* 1*st*.

In reply to Mr. Macfie,

Mr. Forster said that on the 24th of July last the Inspector at Leith telegraphed to the Veterinary Department of the Privy Council that diseased carcases of cattle had been taken twenty miles out to sea and sunk, to which the reply was that such carcases should be buried. There had been some mistake in the matter, and carcases had been washed ashore, but there was reason to suppose that they were not those of diseased cattle, but some healthy cattle which had been washed overboard; but if they were diseased, no blame was to be attributed to the local authorities of Leith.

SATURDAY, *August* 3*rd*.

Col. Barttelot asked the Vice-President of the Council what steps he had taken, or was taking, to prevent the spread of the cattle plague. He remarked that very great excitement prevailed in the country because several cases of the disease had occurred at Newcastle, Leith, Hull, and Hartlepool.

Mr. Forster could only repeat the answer he had given to the House a few days ago. The interest in the subject was, however, so great that he could not be at all surprised that the question had been put to him again. The seventh cargo of diseased animals had arrived at our ports. Two of them had arrived at Deptford, one at Hull, one at Leith, two at Newcastle, and one at Hartlepool. Four

of these cargoes came direct from Cronstadt—viz. those arriving at Deptford, Hull, and Leith. Three others came from Hamburg. In the first cargo the animals were Russian animals; in the last two cargoes, certainly in the Hartlepool cargo, there were no Russian animals. The steps taken were these. The import from Russia was entirely prohibited. It was a most serious matter to prohibit entirely the German import, because the effect would be immensely to diminish the supply of meat in the country, but more especially in London; and nothing but the most absolute necessity would justify it. In consequence, however, of its being clear that the cattle plague must exist at Hamburg, although he was informed that the German authorities themselves did not believe it to exist there, it had been thought right to cancel the order admitting animals from Schleswig-Holstein into the interior of this country; and further, an order had been issued that all sheep coming from Germany must be slaughtered at the place of landing. Special directions had been given to the inspector to watch the cargoes coming from Hamburg. He was very glad to have the opportunity of removing a misconception with regard to the late import of Schleswig-Holstein animals into the port of London. It must not be supposed that the large import of animals took place solely in consequence of the relaxation of the order a month ago, and the admission of the animals into the interior. The import of them had just begun, and consequently they could not have come under any circumstances before; and it would be more convenient to the trade, and probably more profitable, that they should go into the interior without restriction. He did not mean that the trade should be stopped, especially with the high prices of meat, but he was placed in a most difficult position between, on the one hand, the natural fear of persons interested in the trade, and on the other, the idea that the restriction had something to do with the high prices of meat. But if he had done what he had been allowed to do—that was, if he had allowed all German arrivals to be taken into the interior—he could not see what would have prevented the cattle plague from spreading all over the country. (Hear, hear.) The disease took seven days to develop itself, and as the passage from Hamburg was only about three days, it was evident that if there were no restriction the disease would spread over the country.

Col. Barttelot expressed a hope that Government would use the most energetic measures to prevent the infection spreading through the country.

RINDERPEST IN GERMANY.

MONDAY, *August 5th.*

Mr. M'Laren asked the Vice-President of the Council whether he had any information as to what steps the German Government had taken to prevent the introduction of the rinderpest from Russia into Germany.

Mr. Forster said he was informed that an order was issued at Berlin prohibiting the importation of Russian cattle on the whole

Russo-German frontier by sea and land. It appeared, however, that this had not prevented the introduction of the rinderpest into Germany. In addition to the fact that the cattle which had arrived at our ports must have had the disease before leaving Germany, he was informed that the rinderpest had broken out within five miles of Hamburg. He hoped the German Government would soon stamp it out.

CATTLE PLAGUE AND PROFESSOR SIMONDS.

Mr. Newdegate said that, in answer to a question as to the importation of diseased cattle, the right hon. gentleman the Vice-President of the Council had stated on a former day that one of the Government inspectors (Professor Simonds) had been sent down to inquire into the matter. He wished now to ask whether that reply had been strictly accurate.

Mr. Forster said that if he had spoken of Professor Simonds as one of the Government inspectors he had made a mistake. Professor Simonds was no longer in the service of the Government, and he was sorry for it; but in such an emergency Professor Simonds had been kind enough to place his most valuable services at the disposal of the Government. He did not suppose, however, that any objection had been raised by the Veterinary College.

Veterinary Jurisprudence.

CASTRATION OF COLTS.—INSURANCE AGAINST RISKS.

Mr. Simeon Leather, farmer, Delamere Forest, sued Mr. Joseph Roycroft, of Tarporley, for £30 "damages sustained by him by reason of the defendant, as a colt-cutter unskilfully performing a surgical operation."

Mr. Fletcher appeared for the plaintiff, and Mr. Brookes, Nantwich, for the defendant.

The case for the plaintiff was that on the 7th May the defendant visited his stable for the purpose of performing the operation of castration on a colt, and addressing Mr. Hamilton the farm bailiff he asked "Is this colt to be insured?" to which the bailiff replied, "Yes, for £30." He said "All right, as much as you like," and proceeded with the operation without saying anything about what percentage he required. The colt, which was a very valuable one and likely to make a hunter, was committed to the entire charge of the defendant, who had the assistance of four of Mr. Leather's men and superintended them in the way of fixing the ropes and throwing

down the colt. When the operation was performed and the colt came to rise it was found that its thigh had been so severely fractured by the fall that Mr. Dunn, veterinary surgeon, of Tarporley, who attended the same night by Roycroft's directions, said it was a hopeless case, and ordered the animal to be destroyed. This was accordingly done, and the present action brought for the recovery of the insurance money. It was admitted by Mr. Hamilton that the actual operation was well performed.

Mr. Brookes addressed the judge at some length for the defence, contending that, if the insurance were admitted, it merely covered death arising from the actual surgical operation, and had nothing to do with any other accident that might happen. But supposing the insurance did cover the accident, he argued that the plaintiff's own men contributed to the accident and so relieved the defendant from all liability. He also directed particular attention to the words in the summons "unskilfully performing a surgical operation," and maintained that the surgical operation did not commence until the first incision was made with the knife.

Joseph Roycroft, examined by Mr. Brookes, said he had had fourteen years' practice. Mr. Hamilton asked him if he would insure the colt, and he said, "Yes, if you like," but nothing more was mentioned, and he did not consider that the insurance had been effected. There were two men on each side of the colt and one in front. The ropes were attached to the fetlocks, and the men on the opposite side from him gave a sudden jerk which caused the animal to fall with his feet towards him.—*His Honour* asked how it was possible that the colt with a rope fastened to the fetlocks could fall with its feet on the opposite side from that which the men were pulling.—*Defendant* failed to give a satisfactory explanation, and went on to say that when the colt was being secured ten or twelve men came up, and he said to the bailiff, "Don't bring the whole tribe, or you will pull the colt Lymm from Warburton." His charge for the operation was 10*s.*, and if the colt had been insured for the amount named by the plaintiff his commission would have been 30*s.*

The Judge expressed his surprise that the defendant should have so overlooked his own interests as not to adopt the ordinary course with regard to the insurance, upon which he received so large a percentage.

Cross-examined by Mr. Fletcher: His father insured the animals against all kinds of accidents when the operation was performed at his own place, and when he employed his own men. If he (defendant) had had his own men with the plaintiff's colt the ordinary insurance if effected would have covered the accident.

Re-examined by Mr. Brookes: Always reduced the contract for insurance to writing, but that was not done in the present case.

The Judge said there were two points to consider in the case. The first was as to whether the insurance was effected. Of this he thought there was little doubt, and then the question arose, when did the liability attach? It seemed to him that it attached the moment the colt was brought out to be cast, because the throwing

of it down was essentially necessary to the operation, and the defendant evidently superintended the men just as if they had been his own. He had no doubt that in point of law Mr. Leather had a fair right to claim indemnification.

A verdict would be entered for the plaintiff, damages £30, with costs.—*Crewe Guardian.*

WILTS SUMMER ASSIZES, SALISBURY.

Palmer *v.* Cannon.

(*Before* Mr. Justice Lush.)

BREACH OF WARRANTY.—"SHYING."

Mr. Edlin, Q.C., and Mr. T. W. Saunders (instructed by Mr. Dyer, of Bath) were counsel for the plaintiff; Mr. Cole, Q.C., and Mr. Prior Goldney (instructed by Messrs. Keary and Co., of Chippenham) appeared for the defendant.

The action was brought to recover sixty guineas for a breach of warranty of a horse, which, it was allowed, the defendant had represented to be "quiet to ride and drive, and free from vice, and not to crib-bite."

Mr. Edlin stated the case. The plaintiff, he said, was a magistrate of Wiltshire, living at Berryfield House, near Bradford-on-Avon. The defendant was a farmer and auctioneer residing near Chippenham. Towards the end of last year Mr. Palmer was in want of a horse, and a horse dealer named Clark, living at Melksham, informed him that Mr. Cannon had one that would exactly suit him. The plaintiff thereupon wrote to the defendant, stating that he would come over with his coachman to see the animal. The defendant replied that he knew nothing about coachmen, but that he should be happy to show the horse to the plaintiff himself. The plaintiff, nevertheless, took his coachman with him when he went to see the horse on the 26th December. The horse, on being tried, "shied slightly," and the coachman said, "I hope he is not given to these tricks." The defendant replied, "I never knew him do such a thing before." The defendant fixed the price at 100 guineas, but did not warrant the horse sound. All he did was to warrant it free from vice, perfectly quiet to ride and drive, and not to crib-bite. The plaintiff took time to consider, but in the course of a few days sent the defendant a cheque for £100, on which the following endorsement was made and signed by the defendant:—

"Received of Mr. Palmer the sum of £100, for a bay gelding six years old, warranted quiet to ride and drive, free from vice, and not to crib-bite."

The horse did not answer the description given in the warranty. On the contrary, it turned out to be "a persistent and inveterate shyer." It shied at almost everything. On one occasion it ran

Mr. Palmer's carriage into a ditch, and on anotber it nearly put a mare on which Miss Palmer was riding into a similar predicament. In March the horse was sent to a livery stable of a Mr. Strange, at Bath, and Mr. Strange having driven it found that it shied at almost everything. On one occasion it showed a disposition to back into the river, and on another an old woman had some difficulty in getting out of its way. Eventually the animal was sent to Aldridge's repository in London, where it was sold for thirty-eight guineas.

Mr. Palmer was called, and bore out the statement of the learned counsel in regard to the terms of the purchase. The horse was sent to Mr. Clark, at Melksham, for a fortnight, and two days after it came home, his (Mr. Palmer's) coachman drove it to Trowbridge station. It shied at a heap of dirt and some water in the road. It shied going to Trowbridge on the 14th or 16th February, and again on returning from Beckhampton, on the 2nd or 3rd of March, when the spring of the carriage was broken. On the 1st of March it ran off the road on to a grass field, and the carriage was shaken a good deal. It was a dangerous horse for a gentleman to use. It was not quiet, either to ride or drive.

In cross-examination, *Mr. Palmer* said that he did not know that he ever had a horse that did not shy more or less. It depended, however, a good deal upon its "freshness." He might be getting more nervous in riding than he was when he was younger. He denied having told Mr. Collett, of Keevil, that the horse went on very well. What he said was that in his short experience of it he found it to shy a little. He admitted having told Mr. Collett that if the horse turned out as it had been represented to him he should be suited for life. He did not know to whom the horse was sold at Aldridge's.

Mr. Palmer's evidence was supported by Miss Palmer, his coachman, and by Mr. Strange; after which

Mr. Broad, veterinary surgeon, of Bath, was called and gave it as his opinion that the horse suffered from cataract in the off eye of at least twelve months' standing. The disease would account for its shying and render it unfit for a gentleman's use. The sum realised at Aldridge's was a fair price. He was not interested in the sale.

In cross-examination, he denied that all horses shied. He had one that did not do so, even if shut up in the stable for a month.

Mr. Cole.—What will you take for such an extraordinary animal?

Witness.—It is not for sale at any price.

Mr. Cole.—I should think not.

Other witnesses were called on behalf of the plaintiff, at the close of whose case *Mr. Cole* addressed the jury for the defence. The learned counsel ridiculed the idea of the horse being "a confirmed and inveterate shyer" at the time of the sale, in face of the fact of its being kept by the plaintiff for ten weeks without a word of complaint. Mr. Cannon had it in his possession for two years and a half; he would tell them that there was not a more honest horse in the world; and that nothing would have induced him to sell it

but the circumstance of its being too good for his work. Even with the bad character it had received, there were gentlemen who would willingly have given eighty guineas for it at Aldridge's, if they had known of the sale. It was there sold without notice; the defendant was denied any opportunity of inspection previous to the sale; and notwithstanding that every inquiry had been made he had been unable to ascertain what had become of the horse. There was a strong suspicion of "smuggling" after it had left Mr. Palmer's possession, for even the letter announcing that the horse had been sent to Aldridge's must have been posted after Strange had returned from the sale.

Mr. Henry Cannon, the defendant, on being sworn, said he bought the horse for thirty-three guineas, at Crowmarsh fair, in August, 1869. It was then four years old. He rode it from Crowmarsh to Didcot, where it was sent by rail to Chippenham. He rode it home from Chippenham the same night, and next day put it to collar work on his farm. It was so quiet that a boy at 2*s*. a week used to lead it. It was remarkably quiet in stable, and in harness it was one of the straightest horses that he had ever sat behind. It never broke a buckle or a strap during the time he had it. It was an unusually fine goer across country. Nothing was said about its shying when Mr. Palmer and his coachman came over to look at it. It would skip and jump a bit when fresh, as all horses would do, but there was no vice about it. He had driven it through water, and never knew it to rear, bolt, jib, or shy.

The witness was asked in cross-examination whether he ever knew the horse shy, but he declined to answer the question for some time, and said he would stop until Mr. Edlin was tired of repeating it. On being admonished by the learned Judge, he admitted that he had known it shy—all horses would do so at times. He swore most positively that nothing was said about shying by Mr. Palmer's coachman. When he bought the horse it had a lot of warts upon it, which it cost him 10*s*. or so to cure. He was not aware of any disease of the eye, but he knew that it sustained a slight blow on the off eye while he had it.

His Lordship.—Which eye was it?

Defendant.—'Pon my soul I don't know. (Laughter.) I think it was the off eye.

Cross-examination continued—He did not bargain with Mr. Barnes, of Andover, for the sale of the horse to him. Mr. Barnes didn't tell him that it had diseased eyes. Mr. Barnes looked at its eyes, and said it had not breed enough for him. He had ridden it by starlight, by moonlight, and in the dark, but it never shied so as to give cause for fear. It once stopped suddenly with him in moonlight, but he didn't call that shying. He had been to Biddestone revel with some friends, and the horse stopped because of the reflection of the moon in some water. He was thrown out of the trap. (Laughter.) It was all done while he could say "knife." (Laughter.) Mr. Little, who was also in the trap, crawled along the back of the horse, got hold of the reins, turned the trap round, and picked him up. Perhaps they had been living pretty well;

and he should be glad to get salmon and ducks to-day when the case was over. (Laughter.) He was in the habit of going like the wind when in the saddle. For fourteen years he led the Queen's stag hounds, and should have continued to do so but for his increasing weight. Had had great respect for his nags through life. Had shot and buried most of those which did not suit him. (Laughter.)

Re-examined—There were roundabouts and shows at the revel, but the horse went quietly along notwithstanding the noise. He saw other horses being led through the street. If he had known of the sale at Aldridge's he would have kept on bidding until he had got the horse back. He was in London at the time, but knew nothing whatever of the sale.

Several witnesses were called in support of the defendant's case, and among them

Mr. Cannon, jun., and Mr. William Clark, horse trainer, of Melksham, to whom the horse was sent immediately after its purchase by Mr. Palmer. *Clark* said it had been trained to carry gin and water. (Laughter.) He had seen Mr. Cannon with "a little drop," but he thought it perfectly safe for him to ride the horse. Witness drove it eleven times, and rode it to hounds more than once. He saw no symptoms of vice in it, but it jumped a little at the noise of a waterfall near Mr. Ludlow's, at Westbury. The jumping was not sufficient to cause any alarm. He once drove the horse through water up to its belly a distance of 800 yards, and it was then perfectly quiet. His wife, another lady, and a blind gentleman were with him, and if the horse had shied or swerved, they would have been thrown into a deep ditch. That would have been an awkward thing, as witness could not swim. (Laughter.) He had a commission to buy the horse for £70 or £80, after it had been sent to Strange, but he was unable to ascertain where it was to be sold, although he went to London, Bath, Bristol, and Salisbury for that purpose.

Mr. Cole having summed up the evidence,

Mr. Edlin replied, contending that the horse did not answer the warranty, and that if the case set up by the defendant was accepted by the jury, there would be an absolute denial of justice in the matter.

The learned *Judge*, in summing up, said the question which the jury had to determine lay in a very short compass; but it was one on which they would, perhaps, find some difficulty in making up their minds, on account of the diversity of evidence on both sides. They must not be influenced or biassed by the social position of the parties. Unfortunately there was a sort of fatality about these horse cases. The moment they arose there was a direct collision between the parties interested. He had never known a case which, when a question arose about the qualities of a horse, there was not, on one side or the other, a great degree of exaggeration and untruth; and he was afraid he must say that the present one afforded no exception to the general rule. The jury could hardly imagine that the witnesses on both sides were telling the naked truth.

They would probably find great difficulty in dealing with the case, and he was glad that the duty of deciding the question was theirs and not his. The real question for them to determine was whether, at the time of the sale to Mr. Palmer, the horse was quiet to ride and drive, and free from vice. If they were satisfied that it was so, their verdict must be for the defendant. If, on the other hand, they should be of opinion that it could not have suddenly become possessed of the "nimble spirit" of which they had heard, then they must find a verdict for the plaintiff. He thought it a very unfortunate circumstance that Strange was not instructed to say where the horse was, when inquiries were made respecting the time and place of sale.

The *jury* retired to consider their verdict, and, after being absent from the court nearly half an hour, returned a verdict for the plaintiff, damages £30.

COLEMAN PRIZE AWARD.

The Governors of the Royal Veterinary College, at their meeting on August 3rd, received the report of the Professors on the merits of the Essays sent in by the several competitors for the Coleman Prize.

On opening the sealed envelopes bearing the selected mottoes the Silver Medal was awarded to Mr. Peter Avis, Uckfield, Sussex; the Bronze Medal to Mr. Charles Walker Emms, Ilminster, Somerset; and the Certificate of Merit to Mr. Henry Jarvis, Burwash, Sussex.

OBITUARY.

We regret to have to record the death of Mr. Charles Marshall, M.R.C.V.S., Whitechapel, London, in the 78th year of his age. His diploma bears date April 22, 1817. Mr. Marshall was elected one of the first members of the Council of the Royal College of Veterinary Surgeons after the obtainment of the Charter in 1844. He was also elected a Vice-President in 1850. Few members of the profession were more respected than our deceased friend, and his loss is deeply regretted by a very large circle of friends and neighbours.

We have also to record the death of Mr. J. H. Lemon, V.S., Royal Horse Artillery. Mr. Lemon died of cholera on the evening of June 8, at Benares, India. His diploma bears date April 28, 1868.

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Communications and Cases.

BURSATIE.

By Robert Spooner Hart, M.R.C.V.S., Calcutta.

(*Continued from p.* 610.

I concluded my last paper on the above subject by stating that the term "bursatie" is indiscriminately applied to all sores without reference to their benign or malignant nature.

I conceive that in true "bursatie" three distinct forms are rendered apparent by—

(*a*) The papillated bursatic ulcer.

(*b*) The medium bursatic ulcer.

(*c*) The phagedænic bursatic ulcer.

(*a*) The papillated bursatic ulcer, as a rule, is common at the first onset of the malady, and is the least expressed form of bursatie. It is also very similar in its development to "epithelioma." Ulcers of this variety are generally confined to the extremities. They also occur on the penis, scrotum, anterior parts of the body, face or neck, and, when in the latter situation, are almost always situated at the roots of the hair composing the mane. When on the extremities they exist below the hocks, often on the heels, or on the sites of wounds produced by the shoes ; in fact, they are common on any cicatrix, whether as the result of a simple sore, "cut," or previous bursatic ulcer. When simple sores take on the "bursatic" action, they become covered with a dark red, jelly-like material, the production of which is succeeded by a complete arrest of the healing process, or, in other words, by local paralysis. This constitutes the origin of "bursatie," and when once a sore has taken on

this action, the recurrence of the malady is certain. If we take a case occurring on the site of a cicatrix, there may, at first, be nothing to excite suspicion beyond the part being a little elevated above the surface, in which state it may remain for some time, until suddenly, from some irritating cause, it becomes the seat of active action. It is now hot, painful, tender, and excoriated, and gives exit to exudative matter, which scabs on the surface. The discharge is of a yellow, gummy-like character, and hangs about the under part of the ulcer, having an appearance exactly like that which is exuded by a "farcy bud." Ulceration now sets in, and the edges of the sore become everted and throw out luxuriant growths which are quite hard. The further progress of the disease consists essentially in the development of papillæ, which ultimately form a warty cauliflower-like excrescence. The papillæ, after awhile, become longer and more developed, gaining a strong attachment to the tissues beneath. The surface of the ulcer will now present a large red mulberry-like appearance, with white specks of tissue here and there. The circumferent boundary of the ulcer is well marked by a white zonula of skin. The papillæ are spoken of as the cores, or canker of "bursatie;" they can occasionally be drawn out by a pair of forceps. There is no tendency for these ulcers to become scabbed, their form being quite antagonistic to that mode of healing. The number of papillated ulcers which may exist at the same time varies considerably. I have seen from one, two, or three, to eighteen or twenty, in the same subject. If they are neglected, or not subjected to treatment, they will obtain a most formidable size, and project, in an egg-shaped form, from the surface to the height even of a couple of inches. If the ulcer is allowed to pursue its own course it may, after a long time, make an attempt at healing. The surrounding skin gradually ascends the circumferent papillæ, and, on reaching their summits, it commences to draw towards the centre of the sore, until, at last, it suddenly becomes arrested, apparently from having stretched itself to the utmost. In consequence of this arrest a central opening is left, perhaps for the purpose of giving exit to exudative matter. In this state the sore frequently remains for some time, until from some irritating cause or injury, such, for example, as the part being gnawed by the animal, it reopens, and then the papillated condition returns as perfect as it was before. Should the attempt at healing be completed, by which I mean for the whole surface of the ulcer to become covered by a cicatrix, its after course will be the same as when the healing was only par-

tially affected. To use an old proverb, "though the wound be healed the scar remains," which after a period of quiescence will reopen. These circular ulcers, when neglected, require most energetic treatment, in consequence of the deep and strong attachment of the papillæ to the tissues beneath. Indeed, these papillæ have to be uprooted before the complete healing of the ulcer can be effected. Circular ulcers are frequently seen on and about the coronets, and often lead to quite an altered secretion of horn, corresponding in width to their size. In one neglected case, which I saw, a large ulcer had originally been seated on the off-hind coronet, which had been allowed to pursue its own course, until it had healed by forming a wart-like cicatrix, having a small central opening, from which exudative matter was discharged. This ulcer had destroyed the coronet for the space of an inch, and led to a deep, broad fissure with ragged edges, which extended the whole of the way down the outer quarter of the foot. The floor of the fissure was formed of a thin plate of horn, just sufficient to protect the lamina from dirt, but not from other injury.

The operation of healing of a bursatic ulcer by natural efforts is a most imperfect process, for although the sore be covered over a bursatic tubercular mass remains, having its characteristic hard and fixed base. When, however, the healing takes place after caustic applications, I have seen it perfectly effected, at least, so far as that particular site is concerned; but I have never seen the same after self healing. A naturally healed ulcer is almost certain to reopen. Circular ulcers which remain scabbed often present an appearance much like a large "Hunterian chancre," and, indeed, are sometimes called "bursatic chancres."

(*b*) The *medium bursatic ulcer*.—I have so called this ulcer because it marks, as it were, an intermediate stage of the malady.

These ulcers, like the circular papillated variety, are commonly observed on scars, and not unfrequently they extend under the true skin. As a rule, they only occur on the anterior parts of the body, neck, and face; more rarely on the extremities. They are frequently seen on the shoulders under the saddle place and the parts embraced by the girths, seemingly in consequence of these portions of the body being frequently chafed or galled. The favorite spot, however, for the medium ulcer appears to be on the face, a little below the inner angle of the eyelids. The first sign of the formation of the medium ulcer is an elevation of some particular spot,

usually a cicatrix, which may have resulted from the healing of a simple wound or from a previous bursatic ulcer. The elevation would seem to be due to a deposit of adventitious material under the skin, which is more or less oval in shape. The swelling or tumour is somewhat hot and tender. Its production may be followed by a period of quiescence for a greater or less length of time, depending generally upon certain conditions, local and constitutional. Ulceration starts in the shape of a central abrasion or crack which increases in size, and soon passes into an open sore, producing a loss of substance. The ulceration generally begins at the upper portion of the enlargement, and as a rule it extends more rapidly in a downward direction over that part of the tumour which is constantly kept wet with the discharge.

It often happens that while the lower part of the tumour is in an ulcerative state, the upper portion is found to be healing. The sore exudes a sanious fluid, which drying on the surface, and mixed more or less with dirt and hair, forms an imperfect scab. On removing this crust, the exposed surface presents a pale appearance, and the flabby granulations bleed readily on being touched. The edges of the ulcer are undermined and livid, and around its margin various attempts at repair may be seen to be going on. There are frequently other, but smaller nodular formations around the principal one at various distances, the intermediate skin being apparently healthy. These also ulcerate at the same time with the parent tumour, and, coalescing, form a large and extensive sore. When the tumours form under the true skin, the ulceration starts in the shape of a central abrasion, which running on removes the skin until it reaches the circumferent boundary of the tumour. When, however, the deposit occurs under a cicatrix, the ulceration does not behave precisely in the same manner, for on its becoming irritable, the central part will crack, and be followed by the oozing of a grumous fluid. The cicatrix remains in contact, and gradually loses its original appearance by becoming a scab, which remains in position until it falls or is rubbed off by the horse. The tubercles when occurring under cicatrices are larger, and seem more inclined to remain scabbed.

(*c*) The phagedænic bursatic ulcer may be looked upon as "bursatie" *par excellence*. The depositions in the phagedænic form of the disease correspond in every particular to those seen in the medium ulcer, with the exception of being larger, of more frequent occurence, and differing in their after course. In the earlier stage they appear as flat, hard tumours under, and adhering to, the skin. They are also

hot and tender, and of sufficient size to raise the part some quarter or half inch above the plane surface. These tumours generally attain the size of the palm of the hand before taking on an active action. They may also be followed by a quiescent period. Suddenly, and so far as can be determined, without any special cause, the whole of the indurated substance, consisting of the tumour and skin covering it, appears to perish *en masse*. Sloughing follows, and a large ragged cavity with undermined edges is produced, which corresponds in size to the circumferent boundary of the original tumour. More or less infiltration of the surrounding tissues necessarily exists. Although the everted edges of the sore are undermined with tuberculous matter, yet they do not exhibit any change upon their external surface beyond being a little nude of hair. The surface of the sore generally presents a brown or brick-red colour, and exudes a dirty, sanious, grumous fluid, which excoriates the skin over which it passes. After three or four days the sore shows a tendency to scab, this being of a brown colour, and but lightly attached, and that principally in the centre. Its attachment, indeed, gradually decreases towards the margin, and falling a little short of reaching the boundary line of the sore, a portion of the ulcer is left uncovered. In this imperfect attempt at healing the ulcer continues to exude matter, and to go on increasing in size until checked by treatment.

(*To be continued.*)

STRICTURE OF THE OS AND CERVIX UTERI DURING PARTURITION.—OBSERVATIONS ON OPERATION BY INCISION FOR SAME.

By A. E. Macgillivray, V.S., Banff.

In speaking of stricture of the os and cervix uteri during parturition, I do not mean at all to refer to the spasmodic contraction of these parts during labour, which is no rarity to any practically experienced veterinary surgeon.

By *stricture* I mean the existence of a permanent unyielding contraction of material, either a hard fibro-cartilaginous or soft and thickened fleshy material the result of or accompanied by disease of the parts referred to. In some cases, however, I am almost certain that the stricture is congenital.

Where the contraction of the os uteri is the result of prior disease, it will generally be found of a hard fibroid nature;

while, on the other hand, where the contracted parts are soft and very much thickened, acute disease will commonly be found accompanying the stricture.

Ascertaining the presence or absence of actual disease is a point of great importance before giving a decided opinion as to the propriety of operating by incision. A mere stricture, whether hard or soft, of the passage between the vagina and the body of the uterus is not necessarily to be considered a disease, but may be simply an abnormal (perhaps congenital) condition of the part.

The passage between the vagina and uterus comprises the os uteri, cervix uteri, and os internum, and in permanent stricture of this passage the whole of these component parts may be affected, or, at times, only one or other of them. It is most common to find the os and cervix uteri affected together; seldom the os uteri by itself; and least common of all in the lower animals the os internum.

A medical practitioner recently informed me that he very often found the os internum contracted, even after the os and cervix uteri had given way to the full extent. In such cases the uterus, with its contents, is forced as a whole down to the external opening, and thus brings the contracted os internum, generally a very delicate membrane in such cases, into view —which the practitioner ruptures with his finger-nail or divides with a scissors.

As it is not necessary to enter minutely into the anatomy of the parts under discussion, suffice to say that the anatomical structure of the cervix uteri is very similar to that of the uterus itself, with the exception of its having a greater amount of connective tissue and far greater supply of mucous follicles and crypts, and several distinctly formed rugæ or folds longitudinal and transverse.

In *hard* stricture these transverse rugæ or folds appear generally to be transformed into a compact unyielding fibro-cartilaginous material. In one very severe case I found six of these hardened unyielding transverse rugæ or folds between the os uteri and os internum.

In *soft* stricture, without any actual disease being present, the contraction is generally confined to the os and the vaginal portion of the cervix uteri.

In cases of complicated stricture, or, in other words, stricture accompanied with some active disease, it will often be found that the stricture is merely the concomitant effect of the disease, and such causative disease will almost invariably prove to be either ulcerative, scirrhous, really cancerous, or fungous in its nature.

To operate by incision for stricture of the os and cervix uteri in a case where there is any actual disease present would be, to say the least, very ambiguous practice, and only admissible as a *dernier ressort.*

I believe the veterinary practitioner can scarcely meet with a more tantalising case than one of stricture of os and cervix uteri, whether simple or complicated. I happen to know of three cases of stricture which occurred during last winter season, where the professional gentleman called in refused to do anything, and allowed the patients to die.

Having made these prefatory remarks, I now proceed to give the details of a few cases of stricture in which I operated by incision.

Case 1.—I was called very late one night during last spring to a black horned seven-year-old cow, which was said to have been twenty-four hours in calving; "water off, *but her calf bed was not open!*" On arriving at the place, some three miles off, I found that a *cannie* man had been doing his utmost to calve the cow for some five hours, but had only succeeded in getting one finger through the os uteri. The cow had pretty severe pains, and on examination I found the entrance to the uterus quite rigid and firmly contracted, admitting with extreme difficulty two of my fingers. The os uteri partook of the contraction, but seemed quite soft; behind the os, however, in the cervix, there were three successive transverse bands, each completely encircling the passage exceedingly firm and unyielding. They were very hard and quite smooth to the feel, but after the most powerful exertions refused to yield a hairbreadth! What was to be done?

I at once resolved to cut through these apparently cartilaginous rings. As the os uteri could not be got far enough down into the vaginal passage to be seen and manipulated externally, cutting through the contracted cervix came to be rather a difficult matter and required extreme caution in doing. I succeeded, however, in getting a partially covered knife introduced into the contracted parts and made two side incisions "*up and out*" through the three hardened transverse bands of the cervix. The effect was wonderful, the whole parts relaxing almost instantly and the forelegs of a fœtus made their way into the vagina, but it required considerable traction to get the head and subsequently the whole body. There were twins present. Both were born alive and did well. Very little assistance was required in bringing the second calf away.

There was scarcely any hæmorrhage after the operation, and the cow recovered nicely, merely getting the vaginal and

cervical passages sponged out three or four times with warm water at intervals of a day or so, and subsequently smeared with a mixture of Ung. Tapid. Calaminaris and carbolic acid.

Case 2.—Also took place during last spring. In this instance the patient was a two-year-old quey with first calf. She had been unwell for several days, was off her feed, and occasionally had severe calving pains. The whole uterus and its contents were seemingly at times forced into the pelvic cavity, and at such times the walls of the vagina became everted.

On exploration I found the os and cervix uteri firmly contracted, just allowing the introduction of one finger. After trying my utmost to distend the hardened stricture, using various emollients, and giving the patient twenty-four hours "to think about it," I operated by incision in exactly the same way as already related.

In this case, however, the calf was of great size, and it required a tremendous amount of traction to effect a separation between the mother and fœtus. The calf was alive and did well; and the mother, notwithstanding much unavoidable laceration, with good nursing and similar treatment to previous case, came all right.

Case 3.—Took place in May last, the subject being a two-year-old quey with first calf. This differed from the last two in being a case of what I have called *soft* stricture; calving pains had been observed occasionally for five days previously to my seeing the quey. The pains were at times so severe as to bring the os uteri into sight externally; it presented a very inflamed appearance, was extremely ragged in outline; and to my mind considerable fungous excrescence, so to speak, had become developed all round the lips of the same. I don't think the stricture partook in the least of the *hardened* character perceptible in the two previous cases; it was quite soft and attended with much inflammatory action and surroundiug thickening.

I operated by incision in this case in precisely a similar manner as I did in the other instances, and with much difficulty got away a living calf. The poor mother was so frightfully torn with the large size of the fœtus, that I advised the owner to slaughter her as she was in prime condition; but, as she showed every symptoms of being an excellent milker, he would not hear of such a thing. I then ordered like treatment to that adopted in the other cases; but, as I expected, the patient became much fevered and very low, and had to be slaughtered some ten days after.

Case 4.—Happened in June, 1871. The patient was an

aged cow, almost reduced to a skeleton from the effect of rheumatic fever. She had not been able to get on her legs for some three weeks when I was called in.

On examination, I found this a case of hard stricture, the worst case I had ever met with, there being no less than six transverse hardened bands, each completely encircling the cervix uteri. The os uteri was also firmly rigid. I found it utterly impossible to complete the incisive operation in this case; and only succeeded in cutting through three of the transverse rugæ or hardened bands; and as the cow was evidently a worthless subject, and there being no doubt as to the fœtus being alive, I proposed performing the Cæsarean operation in order to save the life of the calf.

The owner at once consented, and seemed highly delighted with the calf, which was alive and ultimately did well. The cow was killed immediately after the operation.

Deposits of a fibrinous nature are but too common in patients of rheumatic constitution, and it seems very probable that it is to this fact we owe the extreme severity observable in this last case; at any rate, the coincidence is worthy of note.

Remarks.—The only difficulty in cases of stricture of os and cervix uteri, likely at first to occur to the practitioner, is the distinguishing of them from simple spasm of the parts. The previous history of the case will in a great measure lessen this difficulty; then it may be possible to make an ocular examination of the parts; and, finally, to one practically experienced mere manual exploration will almost settle the doubt, if doubt there be.

In any case, however, rather than lose my patient, I would have recourse to a free use of the knife.

INOCULATION OF A MAN WITH THE CHRONIC NASAL DISCHARGE OF A HORSE.

By A. J. Murray, M.R.C.V.S., Detroit, Michigan, U.S.

On the 8th of July, 1867, I was requested by Mr. E. Williams, livery stable keeper, in Detroit, to examine a bay carriage horse which had been turned out to grass about eight miles from Detroit. On arriving at my destination I examined the horse, and found the submaxillary glands considerably enlarged, but not indurated; there was also a discharge of yellow fluid from both nostrils; the nasal membrane was a

little redder than usual, but its appearance only slightly differed from that in a healthy horse. The horse was sleek and fat, and with the exception of the nasal discharge appeared healthy.

The object of making the examination was to ascertain whether the horse was glandered or not; I had no hesitation in deciding that he was not glandered. This horse belonged to a man who drove him in a public carriage (here styled a hack), with another horse which he had hired from Mr. Williams to work with him. It was some time before Mr. Williams noticed that the hackman's horse had a nasal discharge, but when he did so, he requested me to examine him with the view of ascertaining whether it was safe to have his own horse worked with him. I did so, and found him affected as already described, and I may mention that this was the first examination of the horse, and that the one already named was made a month or two afterwards. Originally I stated that, although the horse was not glandered, still I considered it unsafe to work a sound horse in the same carriage, as he might contract the disease. This determined Mr. Williams to take his horse from the hackman, who was very much displeased with the opinion which I had given, as he maintained stoutly that the horse's nasal discharge was quite harmless, and could not be communicated to any other horse.

The hackman's horse, I believe, was never subjected to any medical treatment, he believing, as he had said, that the disease was harmless. Shortly after my first examination the hackman happened to cut the end of his thumb, and in working about his horse he was inoculated with the nasal discharge, but thinking the discharge harmless he did not take the precaution of washing his hands. In fact, he was violently prejudiced against the idea of the disease being contagious.

The cut on his thumb ulcerated, and the lymphatics of his arm swelled, and an abscess formed in the lymphatic glands of the armpit, which was followed by several large ulcers on his breast. I believe ten months elapsed from the time of his inoculation to the time of his recovery. Two or three months after his inoculation I met him accidentally, and as what had happened in the interval had somewhat changed his opinion as to the correctness of my judgment, he gave me a description of his case, in which I was much interested, and he also showed me two large ulcers on his breast, one of which was as large as the palm of my hand, and the other a little smaller.

The man after having been under the treatment of a sur-

geon for several months, without much benefit, placed himself under the care of Dr. Farrand, of Detroit, who, on the occasion of my recently making a professional visit to one of his horses, kindly gave me a short verbal description of the case.

The doctor lanced the abscess in the lymphatic glands of the armpit, applied a lotion of sulphate of zinc, two grains to the ounce of water, and gave bichloride of mercury and iodide of potassium internally. The man was also put on rather a stimulating regimen, as he had been used to drink freely, and under this treatment he recovered in about six months.

Mr. Williams' horse, which was driven with that of the hackman, did not contract any disease, but a valuable gray mare about this time became affected with a nasal discharge, showing symptoms similar to those of the hackman's horse, who, until Mr. Williams consulted me, had kept his horses in the same stable. This mare was placed under a tonic course of treatment, combined with the daily use of Rey's nasal tube, but without success. The owner objected to trephining, which I proposed, and the mare was disposed of som etime afterwards.

A month or two subsequently I was called by Mr. Williams to examine another mare. In this case the symptoms were similar to those of the hackman's horse, with the exception that in a few days an eruption appeared on the quarters; the eruption consisted of six or seven small lumps about an inch in diameter: they showed no tendency to ulceration. In about ten days from the first appearance of sickness I observed that the Schneiderian membrane was assuming a very unhealthy appearance, and shortly after an ulcer formed on the membrane. As this case in my estimation was a hopeless one, and as it was also dangerous to have such a case in a large stable, it shortly afterwards passed from under my care. I declined to take a case of glanders to my own stable, and she was taken to that of another practitioner, but as she kept constantly growing worse she was destroyed.

There is a disease (in my experience occurring at all times of the year) which here is called distemper, but which, to speak with more precision, might be defined as an inflammation of the mucous membrane of the respiratory passages. This affection is indicated by discharge from the eyes and nose, soreness of the throat, loss of appetite and swelling of the submaxillary glands, in which abscesses sometimes form. In many cases horses affected with this disease recover without treatment, and continue to work as usual. In other cases, however, the disease is more severe, and is character-

ised by more or less depression. In some cases, rarely, however, the nasal discharge and the tumefaction of the submaxillary glands have a tendency to persist, and it was from a case of this kind that the man was inoculated.

It appears to me that the distemper of the United States, which, I think, might not inappropriately be termed epizootic laryngo-bronchitis, is very closely related to the influenza and strangles of Britain, and it has occurred to me that cases of inoculation such as I have described may have come under the notice of British practitioners. I am aware that many veterinary surgeons believe that influenza is not contagious. I think, however, that a closer examination of the subject will lead to the discarding of this opinion. Maladies such as the influenza and strangles of Britain, and the so-called distemper of this country, vary so much in their manifestations and intensity that what may be predicated of some cases cannot be predicated of all; and I am inclined to think that a closer examination into the characteristics of these maladies may show that they are more readily transmitted than has hitherto been thought.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 616.)

The Corylaceæ.—Mastworts, though a small natural order, is yet one of the most important and interesting in the whole range of the vegetable kingdom, for though it has but about a dozen genera, yet some of these are rich in species, and we have only to mention the three following to at once bespeak attention and excite the utmost interest for our subject. They are:—

1. *Fagus.*—Beech.
2. *Castanea.*—Chestnut.
3. *Quercus.*—Oak.

1. The Beech is one of our native forest trees, and from its attaining to a large size on comparatively thin and poor soil, it is much used in planting. On the great Oolite in Oakley Park, Cirencester, miles of planted beech occur, and as when planted thickly they tower up to a great height without bifurcation, these beechen groves afford a solemn shade, which are no less grateful to the man of thought than

are the curious plants which shelter themselves beneath them welcome to the botanists. In the park we have just mentioned it has been our lot to find the two fungi mentioned by Mrs. Lankester in the following words:—

"The beech shelters and its shade is the favoured locality of two well-known and valuable fungi—the *Morchella esculenta*, the morel, and *Tuber cibarium*, the common truffle. The morel is a mushroom-like fungus, growing in great abundance in the forests of Germany and France, particularly after any of the trees had been burned down. This having been observed, led in Germany to the burning of woods in order to produce morels, and, consequently, a great number of valuable trees were destroyed until it was forbidden by law. The common truffle is, if possible, more highly prized than the morel; it is also more difficult to find, as instead of appearing above the surface like a mushroom, it is buried in the ground like a potato. They are generally found by dogs or pigs trained for the purpose." We have enjoyed both these delicacies gathered from these wondrous woods, but far more have we been delighted with seeing here and there peeping through the rustling carpet of brown leaves such curious plants as

Monotropa hypopitys, Bird's nest.
Listera nidus avis, Bird's-nest orchis.
Epipactis latifolia, Broad-leaved helleborine.
„ *grandiflora*, large white helleborine.
„ *ensifolia*, narrow-leaved helleborine.

Strange that all these should spread beneath the planted trees. Of the latter, indeed, we only found *two specimens*, which, thinking there was sure to be more, were seized by my companion and myself, but, alas! though we looked year after year for other specimens, we have never been so fortunate as to find them, and we are, therefore, led to think that the plants just noted were the only two of this species which were ever found in the Cotteswold district.

But we have wandered "into mid wood shade," where the beech is tall and comparatively slender. If, however, we would see the beech in all his giant glory we must visit solitary trees such as are to be found here and there on the oolitic or the chalk hills, with boles varying from twenty to over thirty feet in circumference. Jesse in his account of forest trees mentions one near Sawyer's Lodge in Windsor Forest, which measures at six feet from the ground, thirty-six feet in circumference.

Leaving such authorities as Gilpin to say that, "on the whole, the massy full-grown luxuriant beech is rather a dis-

pleasing tree," or Evelyn to affirm that "they make spreading trees and noble shades," we would assert that the visitor of the Burnham Beeches, who is not struck with their huge quaint picturesque forms can have but little sentiment in his composition, and yet these specimens have been by pollarding shorn of half their splendours.

The grand separate specimens to be met with on the Cotteswolds from which the drawing of the beech in Selby's 'History of British Forest Trees' might possibly have been taken, carved for a century with names of loving visitors, most vividly recalls the lines of Campbell, only instead of thrice twenty we may say thrice forty "summers."

"Thrice twenty summers have I stood,
In bloomless, fruitless solitude.
Since childhood, in my rustling bower
First spent its sweet and sportive hour.
Since youthful lovers in my shade,
Their vows of truth and rapture paid;
And on my trunk's surviving frame
Carved many a long forgotten name.
Or by the vows of gentle sound
First breathed upon this sacred ground.
By all that love hath whispered here,
Or beauty heard with ravished ear,
As love's own altar honour me,
Spare, woodman, spare the beechen tree."

The size and importance of the beech place it in the foremost rank of British forest trees, while it is not one of the least useful. Its timber is employed for various purposes, such as for furniture, millwork, wooden machinery, piles, planks for ships, &c. It is much used in turnery, and it would seem that we even export it from England for continental use in turning and cabinet work.

In Germany it is said that "thin slices of beech wood were early used by the bookbinders instead of pasteboard for forming sides to thick volumes, and from the German name of this wood, *buch*, "originally came book."

No wood is better adapted for fuel than beech, and we delight in basking before its clear burning blocks in winter, emitting as it does but little smoke. From the small quantity of moisture it contains it is a most economical wood to buy, and has the further merit of being ready for immediate use though sawn up as soon as felled.[1]

The *mast* of the beech is much relished by pigs, but of late years it has been nefariously used for the adultera-

[1] Wood spirit and Pyloligneous acid are derived from the distillation of Beech.—J. B.

tion of different kinds of cattle cake. For this purpose beech mast is even imported from warmer climates after the oil, there more abundant, is extracted, and thus the dry husk is one of the ingredients which forms the *buffum* for sophisticating linseed cake.

2. The Chesnut, or Chestnut, though considered by some as a doubtful native, can yet boast of living examples in England of magnificent size, more than a thousand years old. Strutt says: "The Tortworth chestnut is probably the oldest tree now in England. It is brought forward as evidence by Dr. Ducarel, in his contest with Daines Barrington, respecting chesnut being a native of Britain, as a proof that it is indigenous. In the reign of Stephen, who ascended the throne in 1135, it was deemed so remarkable for its size that, as still appears on record, it was well known as a signal boundary to the manor of Tortworth, in Gloucestershire, where it stands. It is also mentioned as such by Evelyn in his 'Sylva.' At the time that it was thus conspicuous for its magnitude and vigour, we may reasonably suppose it to have been in its prime; if, therefore, we pay regard to the received opinion which is applied to the chesnut, equally with the oak, that it is 300 years in coming to perfection, this calculation takes us back to the beginning of the reign of Egbert, in the year 800, for the commencement of the existence of the Tortworth chesnut. Since that epoch above 1000 years have rolled over its yet green head."—*Sylva Britannica*, pp. 82, 83.

When we last visited this remarkable tree it still possessed a vigorous foliage overtopping the gnarled trunk, which, as far as we remember, then measured fifty-seven feet in circumference. It is taken great care of by its noble proprietor, Earl Ducie, and is well worthy of a pilgrimage of hundreds of miles. Chestnuts flourish remarkably well in different parts of England, those in Greenwich Park are still fine young trees. It is a beautiful tree for scenic effect, and we are told that those only who have visited the mountains of Calabria can properly estimate the beauty of Salvator Rosa's wonderful landscapes in which this tree ever finds a place, and to which they lend a charm which even genius could hardly make any other kind of tree surpass, if equal.

The chestnut has been highly extolled as a timber tree, but we think for the most part upon insufficient evidence. Much of the fame of this wood has arisen from the notion that some of the best old roofs of the kingdom were supposed to have been formed of its timber. Thus Strutt says—"Many of the most ancient houses in London were built of

its wood, as is the roof of Westminster Hall, built by William Rufus in the year 1099, still free from any appearance of decay, and one of the finest productions in its kind, of human art in point of size, beauty, strength, and durability."—*Sylva*, p. 81.

It may, however, be safely affirmed that the roof of Westminster Abbey is not constructed of chestnut wood. In reference to the subject and also to the supposed indigenous nature of this tree, we cannot resist the following extract from P. J. Selby, Esq.

"By some, the chesnut has been considered as indigenous to England, and Sir J. E. Smith (in the 'Eng. Flor.') says, 'that it appears to be wild in the south and west of England.' The more general opinion, however, is, that it is not a native, but was introduced at a very distant period, probably by the Romans, and it is even supposed that the famous chesnut at Tortworth, in Gloucestershire, the remains of which are still in existence, may have been planted during their sway. The belief which so long and so generally prevailed, and, indeed, we may add still partially exists, that the roofing and main beams of many of our ancient buildings and houses were framed of chesnut, naturally gave rise to the idea that a tree so abundant and generally distributed, as it must have been in former ages, must also have been of indigenous growth, for this supposed chesnut timber, we may remark, is not confined to buildings in the southern and midland districts of the kingdom, but is also found in the northern counties, and even in Scotland, for Sir T. Dick Lauder, apparently not aware of the discoveries of Daubenton and others, instances the roof of the parliament houses in Edinburgh, as constructed of chesnut."—*History of Forest Trees*, p. 324.

Our author adds the following in a note :—

"It is remarkable that the same belief of the use of chesnut wood in ancient buildings also prevailed in France. Buffon, however, and afterwards Daubenton, showed that timber taken for that of the chesnut was, in fact, that of *Quercus sessiliflora*."—*Ibid.*, p. 325.

Leaving, then, the further discussion of this subject for a future article, we may yet state that chestnut-wood, of middle size, is highly valued for a great many purposes, and as a nurse to other trees it is most useful.

The bark is worth about half that of the oak for use in tanning.

The fruit has ever been highly extolled on the Continent as an article of food ; *la galette*, a kind of cake, and *la polenta*, a thick paste thinned with milk, form in Italy, and parts of

France an esteemed article of diet. With us it is principally used as a dessert, if we except its Christmas employment in the stuffing of turkeys. Neither the beech nor the chesnut have any medicinal qualities, but still, as useful and ornamental trees, they take a high place, and both are worthy of cultivation, not only for pleasure, but profit. The latter must not be confounded with the horse-chesnut, which is a different tree with bitter fruit; the subject of our present notice, on account of its edible fruit being distinguished as the "sweet chesnut," while "horse-chesnut," on the contrary, is meant to distinguish a fruit not partaken of as food by man, though it might be by inferior animals.

SUPPOSED POISONING OF PIGS BY CONVOLVULUS.

By Harry Olver, M.R.C.V.S., Tamworth, Staffordshire.

That pretty member of the vegetable kingdom, the wild convolvulus (commonly called "laplove"), which, when it extensively prevails, is such a pest to the gardeners, appears to have caused the death of several pigs, the property of Mr. J. Hellaby, of Hogshill near Tamworth, and as such a case of poisoning is to me quite new, I send you a short history of it, thinking that it may be interesting to the readers of the *Veterinarian*.

My attention was first called to the animals on the 10th of August, when I received a message from Mr. Hellaby, asking me to come at once to see some pigs that were dying in a peculiar way. On my arrival I found that six pigs, out of a lot of twenty, three months old, had died since the previous evening. I should state that Mr. Hellaby is a large farmer keeping a number of cows for cheesemaking, and that the pigs in question were fed principally on the "whey," and consequently did not, as a rule, get any green food. This circumstance will probably account for their having eaten the convolvulus, because generally animals appear to have a great objection to it.

Without knowing that the pigs had had anything to eat besides a little barley meal mixed with "whey," I proceeded to make a *post-mortem* examination of one of the last which had died, and on opening the abdomen I found a considerable quantity of serous effusion existing in the cavity; the intestines were empty, with the exception of a very little

liquid and gaseous matter, but the stomach, to my surprise, was full. On opening this organ I found that it contained a large quantity of green-food of a very peculiar character and very badly masticated. There were a few petechial spots on the villous coat of the stomach; but all the other viscera, both of the abdomen and thorax, were perfectly healthy. I also made a *post-mortem* examination of three other pigs, which entirely corresponded with the first, excepting in the amount of effusion into the abdominal cavity.

The question then arose, What was the green-food contained in the stomach? After many inquiries I found that on the 8th instant two men had been digging up potatoes in the garden, the tops of which were covered with and made a perfect mat by the turning of the "laplove" around them, and that these potato-tops, with the "laplove," were in the evening thrown into the pig-stye containing the pigs in question. The animals not being accustomed to green-food had, notwithstanding their natural aversion to the convolvulus, eaten it, as I found pieces of the stems from six to eight inches long in the stomach.

The only symptoms said to be exhibited, and these did not show themselves long before death, were refusal of food, hanging down the head, a sleepy or drowsy appearance, and, in one or two cases, attempts at vomiting. To the remaining fifteen pigs I administered Pulv. Jalapæ ʒj each, in their food, but on the 11th instant, I found on my visit that four others had died. A *post-mortem* examination of one which had just died was made, the result of which was the same, excepting that a little of the green-food had passed into the duodenum; and on examining the brain, which I had not done in the previous cases, I found this organ highly congested.

On the 12th inst. I again saw the animals, and was pleased to find that the medicine had acted, and that the remaining eleven were apparently all doing well.

It would be interesting to know if there are any previous records of cases of poisoning by the common convolvulus; and if it is known what effect the plant has on the animal economy. The general appearances in this case would lead to the supposition that it possesses narcotic principles.

[There are few subjects of greater practical importance connected with the production of disease among animals than that of vegetable poisoning, and, as such, every new fact possesses more than ordinary value. Until now we cannot charge our memories of having had brought to our notice any ill effects produced on animals by their eating of the common convolvulus. With our present amount of information we

should be disposed to attach much importance to the pigs having freely partaken of the potato tops. Their green, watery, and unripe condition would be very likely to act prejudicially. The potato itself belongs to a poisonous order of plants, the *Solanaceæ*.]

DEATH OF A GREYHOUND FROM GENERAL HÆMORRHAGE INTO THE CAVITIES OF THE THORAX AND ABDOMEN, &c. EXTRAORDINARY *POST-MORTEM* APPEARANCES.

Reported by Robert Park, M.R.C.V.S., F.L.S.A., &c., Glasgow.

The dog whose illness and death form the subject of this report was a very valuable one, a noble specimen of the greyhound tribe and well known in the sporting world. His sporting name was "Fritz;" and I am informed that he was one of the swiftest dogs known over a short course, though, from his high fore quarters, he was unable to pick up a hare so deftly as some. At the time of his death he was the property of Dr. Moore, of this city, to whom he had been presented some time previously by a patient. Soon after being brought up from the country, he exhibited symptoms of more than ordinary fatigue after slight exertion, as well as disturbed sleep and restlessness at night, often requiring to be let out once and sometimes twice during the night, and occasionally for no apparent purpose. He suffered greatly from constipation. About a fortnight before he died he became very sick and vomited in the dining-room and the hall. Very little attention was paid to this at the time, as it was supposed he had been surfeiting. A few days after this occurred he had a long run after the doctor's carriage, which so completely prostrated him that he could scarce hold up his head on his return. He rallied, however, and for a couple of days seemed to be as well as usual. He then seemed fairly to succumb and took up his position on the coverlet of his master's bed, from which he could hardly be induced to move. He lay extended at full length on his left side, his head being on a level with the rest of his body. When spoken to he scarcely raised his head. He did not seem to be suffering pain. He breathed tranquilly; his nose was dry, but not hot; his coat was staring; his extremities were cold and his pulse feeble;

almost imperceptible. Beef tea was offered him, which he took. He was drenched twice with castor oil and turpentine. The medicine operated, and he seemed rather better next day; but it was only in appearance, for at night he grew worse. The medicine was repeated. By-and-bye he refused to take his beef tea and gradually sank, not appearing the while to suffer pain. Death took place on June 27, at 2 p.m., terminating an acute illness of seven days altogether. During the eighteen hours immediately preceding death a considerable quantity of bloody matter was vomited, and the mouth and fauces were covered with blood, drops of which fell from his lips.

The *post-mortem* examination was made at nine o'clock. There were no external injuries present, but on turning back the pectoral muscles of the left side a large ecchymosis was discovered extending from the fifth to the eighth rib inclusive. There were no ribs fractured. The moment the abdominal cavity was opened a quantity of blood ran out, and I found that the peritoneal cavity was filled with blood, the intestines lying collapsed at the bottom, *i.e.* on the vertebral column, the body being placed upon its back while the examination was being made.

The thoracic cavity was filled with fluid blood, the collapsed lungs, and air. The lungs were but little crepitous, and neither of them contained heteroplastic deposit of any kind; and although the right one was somewhat congested the left was perfectly natural in colour and texture. The larynx contained a small quantity of blood which had apparently been swallowed, as the trachea throughout its whole extent was natural in colour, clean, and empty. At the bronchial bifurcation, however, the mucous membrane was of a dark sooty colour as if from infiltration of carbonaceous matter. The mouth was covered with blood, and the lips also, and the tongue was protruded beyond their margin. The gullet contained a toughish muco-gelatinous substance, and the mucous membrane was much injected and inflamed.

The pericardium was quite translucent and healthy in appearance; but the connective tissue binding together the great vessels at the root of the lungs and base of the heart was congested and infiltrated with blood. Notwithstanding this the coats of the vessels themselves were intact. The heart was healthy in texture. The left cavity and aorta were normal in appearance and quite empty. The right cavity also was natural in texture and contained a small quantity of fluid blood.

There was a congested spot about an inch in length in the

duodenum, at about the point of its attachment attached to the wall of the abdomen.

The abdomen, as I have before said, was filled with fluid blood. The stomach contained about half a pint of dark-coloured fluid, which had an appearance of being mostly composed of blood, and, indeed, was afterwards proved to be blood by the usual tests. When a stream of water was passed over the mucous membrane, the latter was found to be covered with a dark-coloured membranous deposit. When this was scaled off and placed under the microscope. I found it to consist mostly of blood-corpuscles held in the meshes of an areolar matrix. It was firmly attached to the mucous membrane in some parts, but in others the stream of water had been sufficient to remove it. Underneath this false membrane (?) the mucous membrane was found much congested, and had evidently been the seat of inflammatory action. The rugæ were much thickened and enlarged, particularly at the cardiac orifice. Just beyond the pyloric orifice the mucous membrane of the duodenum contrasted strongly by its healthy appearance with the abnormal condition of the stomach. Though the peritoneal cavity contained a large quantity of effused blood the peritoneum itself was healthy, and free from inflammatory action throughout its whole extent. There were no adhesions whatever. In the meshes of the mesentery, and surrounding the pancreas, there was an extensive effusion of blood, which had become clotted. Nevertheless, there was no rupture of any vessel to account either for this or for the liquid bloody effusion in the peritoneal cavity. The intestines were collapsed and empty. They were carefully passed through the hand, with the view of detecting any foreign body. This I failed to do, however. The liver was normal in size and texture, save one or two hypostatic congestions on its under surface. The gall bladder was moderately well filled with bile.

Both kidneys were examined, and each was found to contain clots of blood in the pelvic portion. The bladder contained a small quantity of urine, but no blood.

Remarks.—The immediate cause of death in the case of this dog is, of course, apparent. Syncope, due to emptying of the vascular system by continued effusions into the stomach and serous cavities, appears to me to have led immediately to death. But the remote cause, or the cause of the continued effusions, is not by any means so plain. Nor is the condition of the stomach. If we suppose rupture of a blood-vessel, overlooked during the post-mortem, we fail to

account for the primary sickness, &c., for the inflammatory condition of stomach, and for the effusion into *several* cavities. Prior to the post-mortem, it was surmised that probably some foreign body, such as a spicula of bone, had penetrated some considerable vessel; but no sign of such an occurrence could be detected, although it was looked for anxiously. A noted Glasgow dog fancier, who saw him just before death, said it was "his lungs" (whatever that may mean); but, although the lungs were collapsed and little crepitous, there was no sign whatever of either congestion or inflammatory consolidation in them. This I made sure of by making a section and placing it under the microscope. It was examined by the owner of the dog (himself one of the most experienced morbid anatomists in Glasgow), who was satisfied that the lung had been subject to neither congestion, nor inflammation, nor any chronic degeneration. The supposition of poisoning again seems to be negatived by the facts of the prolonged illness, and that no known poison would produce secondary effects such as were made manifest by the post-mortem examination. The remote cause of the death, *i.e.* the immediate cause of the effusions, is quite mysterious to me; but perhaps some professional brother whose experience among the canine race is more extensive than mine, will take the trouble to enlighten me on the subject. I think it is within the bounds of possibility that the condition of the stomach may have been due to the drenches of oil and turpentine which were administered for therapeutic purposes.

DESULTORY REMARKS ON THE PRESENT STATE OF THE VETERINARY PROFESSION.

By Senex Membrum.

The circumstance of my having been in the profession forty-five years may probably be a sufficient claim on the attention of the readers of the *Veterinarian* for a few passing observations on our present condition and prospects.

1. The improvements and reforms which have been introduced at the Royal Veterinary College must, I opine, be regarded with satisfaction by all of us, and also result in decided advantages both to the present and future pupils. Sincerely do I congratulate those in office who have contributed to bring about these long needed alterations.

2. I regret to see so much apathy and supineness still

existing in the profession in all which relates to its self-government. Our annual meetings are certainly not worthy of us as a profession, and again and again have I commented on the absence of many of our leading members, and particularly those who reside in the metropolis. This apathy, in my opinion, reflects great discredit upon the town members. Surely they might devote two or three hours once a year to our and their own interests. They have an excellent example shown them, in this respect, by the provincial members. These are, without exception, most punctual in their attendance, and I, for one, feel much indebted to them for their valuable aid and assistance.

3. With regard to the appointment of examiners, I quite concur with the strictures which the editors of the *Veterinarian* have seen necessary to make respecting the co-operation of members of our sister profession on the examiners' board. Such an amalgamation is indispensable, and so far from casting any reflection upon us, I consider it adds to our dignity, and sorry indeed should I be to see that separation effected, which some among us seem bent on bringing about. On the general spirit of the Leaders in the *Veterinarian* I sincerely compliment the writer; but I regret the use of such expressions as "knacker-man's anatomy" and "blacksmith's physiology." They are likely to be misinterpreted, and thus to mislead some who may not clearly understand the principle which is being contended for. Mr. Fleming's castigatory letter is also to be very much regretted. He seems to deplore that the reporter, who attends the council meetings, does not do him and other members justice in reporting their speeches. Few of us are either as eloquent or as earnest as Mr. Fleming, and I can, therefore, easily understand his feelings. Those who do not possess oratorical powers are, perhaps, the better pleased with the brevity of the shorthand writer's notes. Condensation here may be good judgment and sound policy. It has been often remarked that some of the members of the House of Commons who have spoken over night have been astonished next morning to find in the newspapers, splendid reports of the speeches they have made. The public is often unaware that it is the dressing and finishing touch of the reporter which frequently makes a speech even readable.

4. I am sorry to hear that some of the veterinary medical associations are not progressing very satisfactorily. I have noticed that the attendance at the various meetings has been meagre in the extreme, and in this month's *Veterinarian* no report was published of one of the oldest societies, viz. the

Yorkshire. I therefore presume, I hope wrongly, that no quarterly meeting has been held since April. I trust these associations will not be allowed to die out, for I feel certain they have done some, and might do a great deal more, good.

[Let these hints from "Senex Membrum" suffice for the present.]

ALSIKE CLOVER.

By "Con."

With reference to a letter which was published in the August number of the *Veterinarian* by Mr. Earl, and also to one in the past month's issue from Mr. Wheeler, respecting the reputed ill effects of Alsike clover on animals, I should like to ask these gentlemen if they have formed their opinions on isolated instances, or whether they have taken the trouble to satisfy themselves that there were not some noxious weeds growing with the herbage, which caused the mischief they attribute to the clover? I am inclined to think that such must have been the case, as I have seen some thousand acres of Alsike clover grown in different parts of the country, particularly in the west of England, and have also grown it largely myself, but have never known mischief to be produced from its use. Contrary to the statements made, I have found stock to do remarkably well on pastures which contained Alsike clover, and in stocking a fresh field the Alsike invariably disappears first. Not content with my own opinion, I have consulted sound practical men on the subject, and they all agree with me that Alsike is a valuable clover, and possesses good feeding properties. I should further like to know from Messrs. Earl and Wheeler something of the situation where the clover was grown of which they speak, and the kind of soil, and also whether the land was drained or not? I could say a great deal in favour of the cultivation of Alsike clover, but at present I content myself by asking these questions.

DISEASE OF THE PHALANGES OF A DOG SIMULATING WHITLOW.

By "Q. E. D."

The patient suffering from this affection was a large Newfoundland dog, eighteen months old, the property of Dr. D—.

When brought for my inspection he was extremely lame, especially in the right fore limb. By questioning the lad who brought the animal, I ascertained that the malady had made its appearance only two days previously, and was now much worse than on the previous day.

On examination, ulcers were found on the left foot, situated at the juncture of the first and second phalanges of four toes, and on the right foot occupying the uniting medium between the third and fourth phalanges of all the toes. The ulcers on the left foot had burst, and from the surface small sinuses could be traced inwards, so as to involve the deeper seated parts.

On manipulating the other foot, evidences of great pain were produced, indeed, the part fluctuated under the finger. A tolerably large incision was made with a lancet, which gave exit to a quantity of puro-sanguineous fluid; the remainder I squeezed out by means of my thumb and index-finger. After this I saturated a lint bandage with a lotion composed of sea-salt, acetic and carbolic acids, camphor, and rain-water, and gave the lad a four-ounce bottle of the mixture, with instructions for him to wet the bandage with it two or three times a day, and if the bandage came off, either to put it on again, or by other means to keep the dog from licking the sores. I also sent some laxative pills, to be administered daily. The beast left the surgery as lame, if not lamer, than when he came.

The following day the sores on both feet were much about the same; a little fluid trickled down their sides by pressure, but there was hardly any pain. Another small abscess was making its appearance just below the left dew-claw. The parts were kept well bathed with the lotion, in preference to lancing the abscess, thus allowing nature to obtain an exit for its contents. As the pills had not the desired effect, some castor-oil mixture was given.

On the following day the animal was nothing like so lame, the abscess having burst during the night. All the sores were looking better. Continued the lotion. In about a week from this date the patient had so far recovered as to require no further medical treatment.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of August, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Bremen ...	Hull	Foot-and-Mouth	20	4	...	...	24	24
„	London .	„	10	33	...	...	43	43
Boulogne .	„	„	4	...	...	...	4	4
Carentan .	Southampton . .	„	9	...	...	...	9	9
Cherbourg	„	„	...	...	...	8	8	8
Hamburg .	Hull . .	„	6	...	...	...	6	6
„	London .	„	11	52	...	...	63	63
„	Middlesborough	„	1	...	...	...	1	1
„	Newcastle-on-Tyne	„	...	4	...	...	4	4
Harlingen .	Hull . .	„	12	...	...	23	35	34*
Honfleur .	London .	„	1	...	...	...	1	1
Nordenhamm .	Hull . .	„	28	...	...	...	28	28
Rotterdam	Harwich .	„	...	4	...	...	4	4
„	Leith . .	„	2	...	...	...	2	2
„	Sunderland .	„	2	...	...	...	2	2
Total . . .		Foot-and-Mouth	106	97	...	31	234	233*

"Privy Council Office,
"Veterinary Department, 12th September, 1872."

"ALEXANDER WILLIAMS,
Secretary.

* One animal died at the place of landing.

CATTLE PLAGUE.

While it is doubtful whether the cattle plague has been effectually stamped out in the East Riding of Yorkshire, it would be premature to attempt to write a complete history of the outbreak. We may hope, however, that the complete extirpation of the pest will shortly enable us to enter into details which we now omit, for the sake of adverting to certain salient points relating to the introduction and progress of the malady.

One thing requires to be stated in reference to the carcases of the Russian cattle, which were sent to sea on July 23rd, and turned adrift, instead of being sunk, according to instructions; *i. e.* that their appearance on the Lincolnshire coast eight or ten days afterwards, which excited some alarm, perhaps not unnaturally, did not cause much anxiety in our minds. The remarkable thing was the process of reasoning by which the carcases on the Lincolnshire coasts were connected with the outbreak of cattle plague in Yorkshire. No one seems to have thought that the plague so introduced should have first appeared in Lincolnshire, and thence been traced into the East Riding of Yorkshire.

Very little of professional interest, however, attaches to this portion of the subject, and we merely allude to it for the purpose of stating that these carcases had nothing to do with the introduction of cattle plague into Yorkshire. We make this assertion on the fact, which has been clearly demonstrated, that the first outbreak occurred rather before than after any of the carcases had been thrown ashore, and that it is traceable, as are the others also, to the purchase of animals in Hull cattle market on Monday, July 29th, and Monday, August 12th.

Accounts, in the main correct, have been freely circulated respecting the number of cattle purchased at different markets, owners' names, date of discovery of outbreaks, and other matters, which we are not at present concerned with. Our object is to indicate the evidence on which we formed the conclusion that the disease was introduced in a most simple and direct manner from the market at St. Petersburgh into the market at Hull, and thence in an equally direct way to the three districts of Patrington, Bridlington, and Pocklington. It is admitted that Russian oxen bought in the market at St. Petersburgh were distributed in small lots to Hamburgh, Berlin, Deptford, Hull, Hartlepool, Newcastle, and Leith,

and it is known that in such lots, animals affected with the cattle plague were detected.

Fifty-eight of these oxen were shipped at Cronstadt for Hull in the early part of July; and among them there were three diseased animals. Two of the number died on board on the second and fourth day of the voyage, and were thrown overboard.

When the animals arrived at Hull in the third week of July, cattle plague was detected among them, and when a careful inspection of each beast was made twenty were found to be suffering from cattle plague in various stages. The ship with the diseased cattle on board was lying for several days in the Humber dock, close to the "Forin," and not five hundred yards from the cattle market, and in spite of all that could be done, there was open communication between the vessel and the shore.

For nearly a fortnight, cattle affected with the plague had stood on the ship's deck, and it is surely no exaggeration to say that the amount of *contagium* in the excretions which had accumulated was sufficient to infect every head of cattle in the kingdom. Is it necessary, then, to question the probability of some of the virus being carried into the Hull market only the day after the carcases of the Russian oxen were sent out to sea? The precise manner of the conveyance of the poison has not been, and certainly will not be ascertained. No one, in short, saw one of the men who had been engaged about the diseased cattle rub his hand or coat against an animal in the market or on its way thereto. But when a centre of infection has been established, it is not usual to cavil much about the possible means of communication between that centre and a place a few hundred yards distant.

The next link in the chain of facts is the purchase of two animals, a heifer and a steer, at the auction sale in Hull market on July 29th, by a butcher of Patrington. These came from farms in the neighbourhood of Hull, where no disease has existed. They were taken by railway, on the day of purchase to Patrington, and placed in a field adjoining one belonging to Mr. Sanderson, a miller, whose stock—two cows and two calves—were grazing in his meadow.

Twelve days after reaching the field at Patrington, the heifer in the butcher's field was found to be ill, and was slaughtered on August 12th. A difficulty occurs here, which we hasten to meet; twelve days is a long period for the incubation of cattle plague; but we have to observe, for the information of our non-professional readers, that the date

of the discovery of cattle plague is quite distinct from the real date of its outbreak in a herd. In the pure atmosphere of the Yorkshire coast, and in open pastures, the plague, as a rule, does not spread with the rapidity which marks its progress in a crowded cattle shed in a town; and during the last few weeks we have met with several instances of animals remaining well, to the eye of the attendant, for eight or nine days, even when they have been anxiously watched; although when such animals were examined *post mortem* the lesions were clearly indicative of the fourth or fifth day of cattle plague. In the Pocklington case nothing alarming was observed until the disease had spread through the herd, and several of the cattle had died before the nature of the malady was suspected.

Six days after the slaughter of the heifer at Patrington the steer was taken ill, and was also slaughtered. In three days more, a calf in the next field (Sanderson's) was attacked and died the following day. The remaining two calves were found to be ill, and they likewise died in a few days.

In the next week, the two cows were attacked, and died after a few days' illness. We have the distinct statement of one veterinary surgeon who saw the calves, and another who examined the cows, that the animals were the subjects of cattle plague. Whether or not infected cattle were sold in Hull market on the succeeding Monday, August 5th, is uncertain, as none of the animals appear to have escaped the butcher; but on August 12th Mr. Taylor, near Bridlington, bought three steers there, and gave them in charge of a drover to truck them to his place. One of these animals was killed by a butcher at Bridlington; the other two, with one of his own stock, were sent to Hunmanby market on August 19th.

Mr. Berriman, of Pocklington, brought the two Hull beasts, with twenty others which came from a healthy farm near Bridlington. The third animal did not come from Hull. It has been traced to a pasture near Normanton, where it remains perfectly well. In the history of the outbreak among Berriman's stock, it appears that one of the Hull beasts was amongst those first observed to be ill, and then in quick succession the rest of the animals of the herd were attacked. On Mr. Taylor's premises a bull died on September 4th, and cows which had been sent to him on August 31st, two days before he was ill enough to attract attention, were attacked with cattle plague in six days afterwards. From this centre in Bridlington the disease extended to several neighbouring herds.

It is to be expected that reports of outbreaks in the

different parts of, the country will be heard of now that suspicion is aroused; but there is some satisfaction at present in knowing that the disease has not extended beyond the limits of the three infected districts of Bridlington, Patrington, and Pocklington, all in the East Riding of Yorkshire.

From Hamburg we learn that cattle plague had quite unexpectedly broken out afresh in that town.

In the infected districts around Hamburg the keeping up of the *cordons* has been intrusted to the police, the military having been withdrawn in consequence, as was believed, of the complete eradication of the disease. The restrictions with regard to cattle movement are also relaxed.

France has interdicted the importation of cattle from North Germany, Russia, Austria, Hungary, and the Danubian provinces, and also all hides and flesh, both by sea and land. Cattle coming from any other country excepting Spain and Algeria are to be subjected to a careful examination at the ports and custom-houses. Any animal found to be affected with cattle plague will be killed and buried, and the rest of the herd be kept in an isolated place under surveillance. All railway trucks and carriages carrying suspected animals will be cleaned and disinfected. No compensation is to be allowed to the owner of the diseased cattle.

In several circles in Galicia, Poland, and also in Bukovina, cattle plague is still prevailing, and in some the sheep have contracted the malady.

Egypt is also again reported to be suffering from cattle plague around Alexandria. In Upper Egypt a most destructive malady, probably not the European cattle plague, is destroying large herds of cattle. In Esne, near to Thebes, it is stated that three fourths of the animals have perished. The efforts of the Government to arrest the progress of the malady are said to be almost powerless.

SMALL POX OF SHEEP.

In our last number we reported that sheep-pox was again on the increase in Pomerania and other of the North German provinces. We have since learned that the malady has broken out in four parishes between Malmo and Ystad, towns on the coast of Sweden, near to Gottenburg. In consequence of this outbreak Denmark has interdicted the importation of sheep from Sweden.

Facts and Observations.

Sleeping to Death.—We have before referred to a Portuguese account of the singular and always fatal lethargic disease (*lethargus*) observed by physicians to be occasionally prevalent among the negroes of West Africa. Dr. T. H. Baily, who has observed it there, but who is not able more than others have been to explain its pathology, describes it briefly as follows. It is one of the curiosities of medicine. "As the name implies, the principal, and, in fact, only symptom that presents itself is lethargy, and one case is essentially a stereotype of all. The patient, usually a male adult, is seized without any premonitory symptoms, with a sensation of drowsiness, which continues rapidly to increase, in spite of all efforts to throw it off, until he sinks into a profound and seemingly natural sleep. This continues for about twenty-one days, when death takes place. Throughout the course of the disease, the patient preserves a quiet and peaceful countenance, may be easily aroused for a short time, will take nourishment, and generally answer a few questions in a perfectly rational manner. The pulse, respiration, and temperature remain normal throughout; the pupil is neither dilated nor contracted to any noticeable extent, and the urine and fæces are voided with comparative regularity. With the exception of the abnormal tendency to sleep, nothing exists to denote disease. Many careful *post mortem* examinations have been made by competent men, but nothing of an abnormal character has been found. Dr. Smith, colonial surgeon at Freetown, informed me that every remedy that could possibly be of any avail had been used, without any apparent beneficial effect. They sleep on and glide into eternity, in spite of professional skill.—*British Medical Journal.*

Tænia in a New-born Infant.—Dr. S. G. Armour writes in the *Detroit Revue of Medicine*: "We have just now an unique case in the Long Island College Hospital. An infant three days old was found to have *trismus*: and, in the fifth day after its birth, commenced passing well matured *Tænia solium*. Further on, he adds: "Neither Küchenmeister nor Cobbold make mention of the possibility of such a thing; and Vogel, in speaking of tæniæ, says, "They rarely affect children under one year of age." Now here is a scientific nut to crack. How did the tænia gain entrance to the intestinal canal of the fœtus *in utero*, for the child was fed on nothing but the mother's milk?" Our readers will

probably be glad to receive, from authorities on the subject, some expression of opinion on this interesting case.—*British Medical Journal.*

Prize on Nervous Diseases.—A bequest of 10,000 francs has been made to the Academy of Medicine in Paris by M. Falret, for the purpose of founding a prize on mental and nervous diseases.—*The British Medical Journal.*

Presence of Pyrocatechin in Kino.—The author contends that pyrocatechin is contained in the sap of the plants from which kino is prepared, and that it is not formed during its preparation, which simply consists in boiling down the sap, since the temperature at which this operation takes place cannot greatly exceed 100°. The residues from the ethereal extract of kino-gums from various sources, dissolved in water, gave in all cases the characteristic pyrocatechin reaction, viz., a grass-green coloration on the addition of ferric chloride, converted into red by lime-water.—*Journal of the Chemical Society.*

Pathology in Verse.—The *Siglo Medico* of Madrid announced a work on Internal Pathology, by Don José Zalabardo. The author states that it is on a level with the present state of science.—*Ibid.*

The Pathology of the Chignon.—M. Lindeman continues his investigation of the parasitic bodies (Gregarinidæ, found on the false tresses and chignons commonly worn by ladies. They are to be found at the extremity of the hairs, and form there little nodosities, visible, on careful examination, to the naked eye. Each of those nodosities represents a colony of about fifty psorosperms. Each psorosperm is spherical; but, by the reciprocal pressure of its neighbours, it is flattened, and becomes discoid. Under the influence of heat and moisture, it swells; its granular contents are transformed into little spheres, and then into pseudo-navicellæ—little fusiform corpuscles, with a persistent external membrane, and enclosing one or two nuclei. These pseudo-navicellæ become free, float in the air, penetrate into the interior of the human organism, reach the circulatory apparatus, and produce, according to this author, various maladies—"cardiac affections, especially valvular affections, Bright's disease, pulmonary affections." M. Lindeman calculates that, in a ball-room containing fifty ladies, 45,000,000 of navicellæ are set free; and he concludes that it is necessary to abolish false hair, which often proceeds from unclean persons.—*Ibid.*

Lobes of the Liver.—At the meeting of the British Association, Professor Flower, F.R.S., the newly elected Examiner at the Royal College of Veterinary Surgeons read a paper before the Anatomical and Physiological Section on the arrangement of the lobes of the liver. The professor alluded to the great diversities in the arrangement of the lobes of the liver in different animals, which he illustrated by numerous diagrams. He suggested that, in studying these arrangements, the principal thing is to look carefully to the great blood-vessels around which the hepatic substance is grouped, taking the umbilical vein as the central starting-point. Numerous details were given, and suggestions were made with a view to systematize the arrangement of the lobes in various animals, so that the parts may be more accurately described by anatomists than they have hitherto been. In the course of the discussion on the paper it was stated by Professor Struthers that the liver in the human subject is very unequally divided, the right lobe being much larger than the left, and he suggested that this might have some relation to the strength of the right hand as compared with the left. It was also stated that the old system of tight-lacing often introduced changes of form in the liver, and sometimes an additional fissure was in this way produced.

Iodide of Starch.—An aqueous solution of starch is acted upon by iodine only when the water present contains a certain quantity of the latter in the free state. This quantity increases with the temperature, and this explains the decoloration by heat of iodide of starch formed in the cold. The state of equilibrium between the iodide, starch, and water is also modified by time. Iodide of starch has, therefore, no constant composition, and the irregularity of its formations renders many precautions necessary when it is used in volumetric analysis.—*Journal of Chemical Society.*

Occurrence of Paralbumen in Serous Transudations.—In two cases of ascites fluid Dr. Hilger has found an albuminoid substance characterised by its solubility in water after precipitation by alcohol, and also by its incomplete coagulation by small quantities of acetic acid. This substance—paralbumin—has hitherto been found only in ovarian cysts.—*Ibid.*

THE VETERINARIAN, OCTOBER 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

OPENING OF THE WINTER SESSION AT THE ROYAL VETERINARY COLLEGE.

THE winter sessional course of study which opens just as our present issue will be in the hands of our readers commences under favorable auspices. Permanent additions have been made to the educational staff; the course of instruction has been entirely rearranged; old rules have been modified, and new ones introduced. Probably the last thing which a student thinks of reading is a copy of the rules which are framed for his guidance; we have, therefore, no scruple in recommending every pupil to master this, to him, important subject without delay, and by way of assisting him we propose to comment on some of the most important of the changes which are made.

Prominently stands the rule which strikes a blow at deliberate idleness, which, although exceptional, nevertheless exists and must be met. Men, even of average intelligence, may by the exercise of assiduous care succeed in passing a satisfactory examination at the first attempt, or, failing by accident in this, would scarcely suffer a second failure which they had honestly tried to avoid. Some there have been, however, who perceive no disgrace in repeated failure, and without compunction present themselves again and again before the board in the belief that chance must at length favour them. By way of stimulating this indifference to something like action, the College authorities have provided that a student, after being thrice rejected, either at his preliminary or diploma examination, shall pay a further fee before he can claim the privilege of again attending the collegiate studies, and then only for such time as the Principal may determine on. The Council of the Royal College of Veterinary Surgeons has already required extra fees for every

examination after the third; the pressure, therefore, which will be put on the idle will be urgent, but not unduly severe.

Another rule provides for the regular attendance of the pupils at all the lectures and demonstrations; absence from any department of instruction will be taken as absence from the College, and must be compensated by additional attendance in the future. Certificate of attendance must be signed by each Professor, and without such signatures the candidates cannot obtain the right to present themselves for examination before the board of the Royal College of Veterinary Surgeons. Further rules have for their object a better acquirement of practical knowledge than hitherto the pupils have possessed. Rules directed to the preservation of order and propriety of conduct are, as a matter of course, consonant with the feelings of gentlemen, and we should by implication insult the class if we ventured to point out their obvious intention, or to enforce their reasonable requirements.

At an age when liberty is dear to the heart it would be too much to expect that men should manifest any anxious desire to place themselves under restraint; but, if they are wise, they will admit the necessity for rules to enforce order, and will, without hesitation, obey them. The voluntary system in this respect is very well in theory, but in practice it is found to succeed only with the most enthusiastic students; and it is, at least, probable that even those who have done well of their own good intention would have done still better under reasonable restraint.

For the comparatively short period of two winter sessions and one summer session it is not too much to expect that the pupil who desires to master the science of his profession will set himself steadily to work. With the present arrangements for study, no single hour of the day need remain unoccupied; the infirmary, the dissecting room, the laboratory, the museum, and the library, will afford opportunities too valuable to be disregarded for filling up the outlines of knowledge obtained in the lecture room.

It may appear, at first, that a too exclusive attention to study will be mentally and physically injurious. We do not share these fears; there will be plenty of time for recreative

rest between the sessional periods, more, indeed, than can safely be devoted to inaction.

A longer period of study may hereafter be found necessary to enable the student to properly grasp the subjects which will be brought under his notice. Meanwhile, the fact that the time is short furnishes the strongest argument against wasting any portion of it.

Extracts from British and Foreign Journals.

ON THE DEVELOPMENT OF BILHARZIA HÆMATOBIA; TOGETHER WITH REMARKS ON THE OVA OF ANOTHER URINARY PARASITE (THE SO-CALLED TRICHINA CYSTICA OF DR. SALISBURY) OCCURRING IN A CASE OF HÆMATURIA FROM NATAL.

By Professor T. Spencer Cobbold, M.D., F.R.S.,
Lecturer on Botany, Parasites, and Parasitic Diseases at the Royal Veterinary College.

(*Continued from p.* 646).

It is also noteworthy that the development of the larva is equally well accomplished in distilled water, in well-water, and in brackish water; whereas in pure sea-water the process goes on somewhat less satisfactorily. It was found, indeed, that the addition of slightly saline water to ciliated embryos, which were on the point of expiring in fresh water, had the effect of reviving them for a time. These facts, as we shall see presently, have an important practical bearing; but in the meantime I have to observe that the actual mode of escape of the embryos is by no means the slow process that Bilharz has described. Almost invariably the shell bursts by a longitudinal slit extending over fully two thirds of its long diameter; the first point of rupture being commonly situated midway between the spine and the centre of the shell. In normal births, so to speak, the head of the animalcule emerges first; but occasionally the animal escapes sideways (Fig. *k*), and I have even seen the embryo extricate itself tail foremost. Not unfrequently it has a difficulty in detaching itself from the shell, in which case the latter is whirled round and round by the half-freed prisoner. The lodgment of the beak against any foreign substance, under such circumstances,

affords the necessary leverage for ensuring the embryo's ultimate success.

According to my observations, the larva never displays its proper elongated, spindle-shaped, or cylindro-conical figure, until some short time after its escape from the shell; and, as a consequence of this, its powers of locomotion are less marked at first than subsequently. At the time of extrusion, the larvæ are commonly more or less hour-glass shaped (Fig. *i*); this particular figure being sometimes retained for many minutes or even for an hour (Fig. *h*). Usually the larvæ have a tendency to acquire their normal shape immediately after quitting the shell; the oval, pear-shaped, and variously constructed forms gradually merging into the characteristic cone-shaped animalcule (Figs. *g*, *i*). In their fully developed condition, they exhibit the most lively movements; and to witness several hundreds of them rushing about with unceasing activity is certainly a curious sight. The phenomenon, moreover, loses none of its interest from the consideration that only a few hours, or it may have been minutes, previously, these now actively gyrating animalcules were lodged *in ovo* within the blood-vessels of their human host. From persons who are seriously infested, millions of these eggs of *Bilharzia* daily make their escape during the act of micturition; and, when this act is accomplished by the host out of doors, it is easy to perceive how readily the ova may be subjected to conditions eminently favorable to the further development of their contained larvæ. The direct passage of the urine into any considerable receptacle of natural or fresh waters would in a few minutes ensure the hatching of all the eggs; and, in the absence of any such direct aid to development, the accidental occurrence of a shower of rain would, in all localities where this disease is endemic, readily transfer the ova into ditches, ponds, rivers, lakes, and ultimately perhaps even into the sea itself. Under ordinary circumstances, it is true, the eggs would comparatively rarely gain access to the sea. Moreover, as I shall show immediately, pure sea-water seems to be an unsuitable medium for them.

The behaviour of the embryos under the action of reagents of various kinds is very remarkable. Thus, when, on the 5th of September, 1870, I placed some ova in brackish water, of the strength of two parts of fresh water to one of pure sea-water, their contents were readily developed, though the escaping embryos did not swim vigorously. When again I placed some other eggs in pure sea-water, their contained embryos became instantly transfixed, the vibratile cilia of the head at once becoming rigid and motionless. At first, I

naturally concluded that the embryos were killed outright, but here, to my surprise, the shock passed away in about half an hour, when they revived, and were soon afterwards hatched. One of the larvæ thus set free carried off several of the loose intrachorional globules which had, during the period of transfixion, become firmly adherent to the ends of the caudal cilia. Here also I may remark upon a decided difference observable between the cilia of the head and body respectively. The former are at all times vibratile, active, and conspicuous; whilst the latter are more delicate, capable of comparatively little motion, and partaking more of the character of vibrissæ. In length, their general measurement varies from $\frac{1}{2500}''$ to $\frac{1}{2000}''$. The action of pure sea-water on the free animalcules, previously immersed in fresh or brackish water, was equally striking. All, without exception, immediately became paralysed and almost motionless; nevertheless, on again adding fresh water, several entirely recovered. It is worthy of notice, also, that in these cases the cephalic cilia furnished the first indications of returning viability. I was particularly struck with the behaviour of one embryo, which, under the stimulus of the sudden shock, retracted its cone-shaped head almost entirely within the general cavity of the body (Figs. *o*, *p*). In their moribund condition, whatever shape the embryos retained, I observed that the sarcodic contents gradually faded away; the outline of the creature, however, becoming, for a time at least, even more marked than was normally the case. Usually, the body of the animalcule became considerably elongated whilst expiring in sea-water. Under other circumstances, as we have seen, the embryo frequently bursts; the sarcodic contents escaping in the form of amœba-like bodies, and the cilia retaining their powers of movement long after all traces of the sarcode have disappeared.

There are other points of interest connected with the appearances and distribution of the cilia, especially as furnishing diagnostic characters. The larvæ of *Bilharzia* more closely resemble those of *Fasciola hepatica* than they do some of the more typical flukes. According to the recent observations of Dr. Willemoes-Suhm (*S. und K. Zeitsch.*, 1871, s. 181), the cilia of the embryos of the *Distoma megastoma*, which infest various sharks, are limited to the anterior pole of the body. This is also the arrangement, as Leuckart first pointed out, in *Distoma lanceolatum*. On the other hand, Pagenstecher has shown that the embryos of *Distoma cygnoides* and *Amphistoma* (*Diplodiscus*) *subclavatum* are ciliated all over—an observation which, as regards the latter species, has been amply confirmed by Wagner and others. Dr. Alex. Pagenstecher's

original statement, to the effect that "intra-chorional germs of trematodes offer no distinctive characters," must, therefore, in the present state of our knowledge, be accepted as a general conclusion admitting many exceptions.

As regards the intimate structure of the embryo, I have further to observe that, shortly after the extrusion of the larvæ from the shell, the hitherto loose globular particles of sarcode now coalesce, apparently as a preliminary step towards a subsequent differentiation into special organs, which are probably destined to become "nurses" (Figs. *g*, *i*). Within the head, we may sometimes notice two, and sometimes three, pedunculated bodies presenting various appearances; but, when three are present, one of them is constantly more conspicuous than the other two. This most prominent blind sac I suppose to represent the stomach of the larva in its future cercarian stage. Under the very perfect $\frac{1}{12}''$ objective glass—employed by Professor Stricker, of Vienna, when he was in this country—I had an opportunity of examining these structures exhaustively; and in the cavity of the central blind sac I distinctly recognised numerous highly refracting granules, the diameter of which averaged not more than $\frac{1}{12000}''$. The rudimentary stomach is often traceable whilst the larva is still within the egg. It measures about $\frac{1}{500}''$ in length, including the peduncle; and $\frac{1}{14000}''$ in breadth. The width of the narrow stalk does not exceed $\frac{1}{9000}''$. The other two stalked bodies appeared to me to have the character of the so-called *lemnisci* of Dujardin and others, being also occasionally well seen whilst the embryo is still within the egg. The varying appearances presented by these stalked blind sacs rendered it difficult to interpret their morphological and physiological significance with precision. If Dr. Harley's observations be correct, two only of these bodies are constantly present, and communicate with the oral papilla by two distinct tubes and apertures. I regret that I have never had the good fortune to see these orifices; but I do not on that account doubt their presence. As regards the integument, it is easy to recognise two layers, especially when the epidermis is unnaturally raised by endosmosis and injury. In careful adjustments of the focus, the inner wall of the transparent dermis presents a beaded appearance. Moreover, these minute and regular markings do not undergo the slightest alteration during the contractions of the body of the larva. In advanced embryos, the sarcodic masses also invariably retained their general characters during contraction of the body. But, without dwelling further on such comparatively uninteresting matters, it yet remains for me to assert

the presence of a highly developed water-vascular system in these little animalcules. On many occasions I saw traces of this set of vessels; and in several instances I obtained the most satisfactory, not to say beautiful, views of the entire series. Anxious to receive confirmation of my discovery, I demonstrated the existence of these vessels to a skilled microscopist—Mr. J. G. Pilcher, of H.M. Indian Army—who expressed himself perfectly satisfied as to the correctness of my interpretation of their true character. In the briefest terms, it may be said that the water-vascular system of *Bilharzia*, in the larval condition, consists of two main stems, which pursue a tortuous passage from head to tail, and which, in the course of their windings, give off several anastomosing branches (Fig. *w*). As also obtains in the corresponding larvæ of *Diplodiscus subclavatus*, there is no excretory outlet visible at the caudal extremity.

Experiments.—Encouraged by the experiences and determinations of Pagenstecher and Wagner among the Trematoda, and also more particularly by the remarks of Leuckhart in connection with *Distoma lanceolatum*, and his success with the larvæ of *Echinorhynchus*, I naturally sought for the possible intermediary bearers of *Bilharzia* among fresh-water molluscs and small crustacea. Failing of success in these, and quite independently, it occurred to me that the larvæ of *Bilharzia* might normally reside in fluviatile or even in marine fishes. This latter idea seems also to have struck Dr. Aitken almost simultaneously. In an appendix to his Report to the Army Medical Department for 1868, dated from Netley, November, 1869, Dr. Aitken gives a figure of a nurse-form, which he terms a cercaria, from the tail of a haddock—suggesting for *Bilharzia* some genetic relation of this sort, and also extending his views in reference to certain larval trematodes found in and extracted from the so-called Delhi boils and Lahore sores. Figures of the parasitic forms last referred to, and obtained from different persons, are given by Dr. Aitken, from drawings supplied by Dr. Joseph Fleming, of H.M. Indian Army, who had sent them from Meean Meer, in the Punjab, North India. In regard to the juvenile flukes from the haddock, I may say that I have thoroughly satisfied myself that these well-known immature trematodes from the nerves of the cod-tribe can have no genetic relation with *Bilharzia*; and I think it due to Dr. Maddox to say that I accept his conclusion respecting them. In his admirable paper (*Microsc. Trans.*, vol. xv, 1867, p. 87), he offers strong proof to the effect that the so-called *Distoma neuronaii Monroii*

of the haddock (*Morrhua æglefinus*) is neither more nor less than the juvenile condition of *Gasterostoma gracilescens* of the angler (*Lophius piscatorius*). After these indications, it is a sorry circumstance to have to state that all my experimental efforts yielded only negative results. I tried to induce the ciliated embryos to enter into the bodies of a great variety of animals, such as Gammari, Dipterous larvæ, Entomostraca, Lymnæi, Paludinæ, different species of Planorbis, and other fresh-water molluscs; but neither in them nor in Sticklebacks, Roach, Gudgeon, or Carp, did they seem inclined to take up their residence. These experiments, however, are by no means conclusive, since the conditions under which the experiments were made departed in several respects from those that are presumably essential to success in the ordinary course of nature. On what grounds, however, Dr. John Harley could possibly expect to rear *Bilharzia* by feeding dogs and rabbits with the ova, I am at a loss to understand; and his apparent suspicion that the parasites "may increase in the [human] body from the development of the eggs" in a direct manner, is to me a mere haphazard conception, and one which virtually sets at nought the well-established experiences of every original experimenter whose name is known in connection with the advancement of helminthology in its ontogenetic bearings. Throughout the whole of Dr. Harley's remarks on this head—and I confess to have had the greatest difficulty in comprehending the purport of many passages—the generally received opinion as to the necessity of an intermediary host amongst the Trematoda seems to me to have been altogether overlooked, and therefore to that extent utterly ignored. So far as Dr. Harley is concerned in this particular relation, the teachings of Leuckart, Pagenstecher, Guido Wagner, Siebold, Van Beneden, and especially Filippi, are altogether a dead letter.

Appendix.—A most interesting circumstance connected with this case of *Bilharzia* lies in the fact that I obtained from the patient some other urinary parasites in the egg-condition. On five separate occasions, I obtained one or more specimens of the eggs or embryos of a minute nematode. In one instance, there were about fifty of these ova in the urine; their embryonic contents being well developed, and in a state of activity. Usually they were all in this advanced condition; but on the 25th of July, 1870, several were observed in much earlier stages of development. One of these was of a triangular form; its shape, granular contents, and fine limiting membrane, indicating separation from the ova-

rian tube without impregnation (Fig. *t*). Another early form was perfectly spherical, with a well-marked chorional envelope and only a less marked double contour (Fig. *r*). These forms measured about $\frac{1}{750}''$ in diameter. The fully grown eggs observed at the same time gave a longitudinal measurement of $\frac{1}{500}$ by $\frac{1}{1000}''$ in breadth. On adding any stimulus to the ova, such as diluted sulphuric acid, the embryos moved themselves freely within the egg. After allowing the urine to stand for forty-eight hours, I found, on the 27th of July, that the shells of the ripe ova had dissolved, leaving the embryos dead, but still coiled within a fine transparent envelope (Fig. *v*). In this state, they were easily separated and examined, when they gave a measurement of $\frac{1}{300}''$ in length by $\frac{1}{3500}''$ in breadth. On two occasions, whilst engaged in rearing the larvæ of *Bilharzia* in water, I noticed single specimens of these embryos lying dead; and one of the examples thus observed had evidently grown since it was extruded from the shell, for it gave a length of $\frac{1}{150}''$, by $\frac{1}{3000}''$ in breadth.

I have been thus particular in recording these facts, because future discoveries may enable us to identify the species of nematode to which these ova are referable. Putting aside the question of *Spiroptera hominis* (which the Berlin helmintholo-gist Schneider determined to be only the well-known *Filaria piscium* artificially introduced into the human bladder), I know only one set of observations on record which appear to refer to this same species of parasite. I allude to the statement of Dr. J. H. Salisbury, as given in Hay's *American Journal*, vol. lv, for 1868, p. 376. In his paper on the Parasitic Forms developed in Parent Epithelial Cells of the Urinary and Genital Organs, Dr. Salisbury refers certain nematode ova to a distinct and new species of entozoon, which, although he has evidently never seen the parasite in the adult condition, he has had the boldness to conjecture, must belong to the genus *Trichina*. Of course there are no adequate helminthic grounds for this generic allocation; but the facts recorded by Dr. Salisbury do not on that account lose their remarkable interest and value. So important do I deem them in relation to certain vexed questions connected with urinary parasitism in man, that I do not hesitate to quote his brief description, which runs as follows:

"*Trichina cystica* (Salisbury).—This is a small species which I have found in the human bladder. In all my examinations, I have met with this little entozoon in three cases only. In two of these it was only occasionally met with in the urine. In the other, a Mrs. R., of Cleveland, it occurred

in great numbers. Frequently from ten to fifteen ova were found in a single drop of urine."

Now it is important to remark that it does not appear that there was any hæmaturia in the last-named case, which Dr. Salisbury describes as one of "cystinic rheumatism," or "severe cystinæmia associated with rheumatism and paralysis." The patient has been insane for several years. Her urine was passed milky, with granular cystine, and was dense and scanty." It is likewise added, "No examination was made of the muscles after death to determine whether this species burrowed in the tissue, like the [*Trichina*] *spiralis*."

So much for the principal facts recorded by Dr. Salisbury. His paper is accompanied by two woodcut figures of the ova (× 300 diam.), and one representation of the embryo (× 1000 diam.) If these figures give the size correctly, the ova measures only about $\frac{1}{800}''$ in length by $\frac{1}{1500}$ in breadth; whilst the embryo would be about $\frac{1}{500}''$ from head to tail. However, notwithstanding these discrepancies as to size—and it is evident that Dr. Salisbury's figures do not make pretension to absolute accuracy in this respect—I am inclined to think that Dr. Salisbury and myself have been made acquainted with nematode eggs and embryos referable to one and the same species of parasite. At present, I do not care to speculate very freely as to the origin of these ova; but I may remark that, although I long ago gave in my adhesion to the determinations of Dr. Schneider in respect of the pseudhelminthic character of the so-called *Spiroptera hominis*, I am by no means certain that his position in this question may not be disturbed by fresh discoveries. It is not a little remarkable that the parents of my patient should have averred that she passed three small vermiform entozoa by the urethra; corresponding, to judge from their verbal statements, very closely with the ordinary appearances of *Filaria piscium*. It is likewise worthy of note, that this patient had also played the part of "host" to about a dozen large lumbrici, for the expulsion of which she had been successfully treated by Dr. Lyle, at Durban, Port Natal. Into the clinical bearings of the case, however, I have no need to enter, since I have already fully discussed this part of the subject in my newly issued work on 'Practical Helminthology.' — *The British Medical Journal.*

FUNGI IN COWS' MILK.

By James Law, Professor of Veterinary Medicine and Surgery, Cornell University, New York, U.S.

(Reprinted from *The Lens*.)

The presence of living organisms in milk has been recognised by various observers. Thus, in milk of an abnormally blue colour Braconnot detected a cryptogam to which Lamarck gave the name of *Byssus cœruleus*. In other specimens of blue milk, Quidde, Fuchs, and Ehrenberg found a swarm of infusoria which they named, accordingly, *Vibrio cyanogens*. Yellow milk was found by Fuchs and Verheyen to abound in a yellow vibrion, *Vibrio zanthogens*. Verheyen alleges that both these vibriones are present in milk which shows a greenish tint. Dr. Percy's Report to the New York Academy of Medicine in 1858, "On Swill Milk," shows the presence of spores in such milk when drawn, and the growth of mycelium within twenty-four hours thereafter, though the liquid had stood in a well-corked bottle in the interval. This report shows, further, the tendency of such milk to induce severe and even fatal disorders of the digestive organs of infants fed upon it exclusively in its fresh condition.

As a further contribution to the pathology of this secretion, the following observations may not be uninteresting to the readers of *The Lens*.

On October 1st, 1870, according to pre-arrangement, Mr. Potter, of Ithaca, New York, brought me a specimen of the milk yielded by one of his cows the same morning. This milk looked good, and even rich; it presented nothing unnatural in colour, consistency, or flavour. It was at once divided into five separate portions. One portion was put into a clean, scalded bottle, and well corked,—No 1. A second portion was put into a bottle with two drops of carbolic acid,—No. 2. A third portion was put into a bottle with five drops of sulphurous acid solution,—No. 3. A fourth portion was first raised to 212° Fahr., and then placed in a well-corked bottle,—No. 4. The remainder of the milk was left in an open bowl,—No. 5. Some pure milk obtained for the use of my baby was placed in a scalded bottle in the same room with the above,—No. 6.

Owing to other and more pressing engagements, no microscopic examination was made until the same evening, when the milk had been twelve hours drawn. At this time the cream thrown up by Nos. 1 and 5 had become viscid

and fell in fine threads from the point of a needle dipped in it. Placed under the microscope, it showed an abnormal adhesiveness of the oil-globules, which had accumulated in dense masses, in place of remaining apart as in healthy milk. Intermixed with the globules were dark-coloured spherical bodies of a much larger size (spores), and filaments. This cryptogam steadily grew, and at the end of forty-eight hours had attained considerable dimensions.

Neither at this date nor later did any of the other specimens present the tenacious character of the cream nor any cryptogamic growth.

On October 9th I visited the farm where the cows were kept, went over the buildings and pastures, and secured specimens of the food and water. The buildings were clean and well kept. The pastures were on a dry, open, sabulous soil, well drained by reason of their structure and their abrupt inclination to the north, and resting on the calcareous formation common to the district. On a careful search no decomposing matter, animal or vegetable, was found sufficient to arouse suspicion. The food presented nothing abnormal. Water was obtainable at two points in the pasture. One was from an open spring, which looked perfectly clean and pure; the other spring flowed from a bank rich in black vegetable matter (muck), and was carried by a wooden gutter into a trough of the same material. The naked eye could detect nothing amiss with this water, though, as is usual in hot weather, the sides of the trough were covered with a green vegetable product. As the water issued from the bank in a constant stream, it overflowed the trough and stood in little stagnant pools in the imprints of the cows' feet, mixed with the fæces and urine of the animals. There is no reason, however, to suppose that the cows drank out of these mud-holes. In the absence of suitable vessels, water was taken from the trough and from the spring first mentioned into the same bottle.

On examination this water was found to contain numerous diatoms and many ovoid or elliptical bodies, which appeared to be spores of some low form of vegetable life.

A little of this water was added to some baby's milk from the same source as that which gave negative results in the first experiments, and corked up in a previously scalded bottle. Three days later it had acquired the viscidity of the impure specimens, and contained numerous spores and mycelium.

The water was allowed to stand in the corked bottle for one month, and on November 9th contained an abundant cryptogamic growth.

At the same date on which the milk was obtained two cows then giving impure milk were examined in the field. They appeared in health, so far as appetite, rumination, pulse, breathing, the state of the skin, &c., were concerned. but the clinical thermometer introduced into the rectum rose to 102° Fahr., the temperature of the other cows averaging 100°. From an incision in the tail of one of the affected cows a little blood was obtained, and on microscopic examination this was found to contain ovoid bodies of at least double the size of the ordinary blood-globules. After having stood eight days in a corked bottle, this blood showed a luxuriant growth of mycelium.

On October 9th, the same day it was drawn, a drop of this blood was added to the pure baby's milk already referred to, placed in a scalded bottle, and well corked. On October 14th this, too, presented a rich fungoid growth.

It only remained to ascertain the effect of withholding the water and using some of those parasiticides from which good results might be expected without any probability of taint or material injury to the milk. The spring and trough were accordingly fenced in, water supplied from a well at the buildings, and drachm doses of bisulphite of soda given to all of the stock for a week. The impurity of the milk at once disappeared, and has not returned.

The chain of evidence now appeared complete. The water contained vegetable spores, which developed into a luxuriant growth of mycelium when allowed to stand or when added to milk of known purity. The presence of similar germs in the blood was demonstrated by microscopical examination, by the further development of the cryptogam when the blood was allowed to stand, and by the appearance of the same product in milk to which a drop of this blood had been added. The constitutional effect of its presence was slight, being manifested by a rise of temperature not exceeding 2° Fahr. The germs in question were present in the milk, and grew with great rapidity in this medium. Lastly, the disuse of the contaminated water and the administration of sulphites put an end to the affection.

The experiments, it is true, might have been more satisfactory had they been conducted in a proper isolation apparatus; yet with the counter-experiments on pure milk and boiled tainted milk standing side by side with them, in precisely the same conditions and without the development of any such product, it does not seem that the conclusions can be fairly objected to.

There is one more feature of the case which ought not to

be passed without notice. Out of a herd of about twenty cows only one or two were attacked at first, and after giving tainted milk for a week or more they recovered, while one, two, or three more had in the meanwhile been taken ill. At first the whole of the milk was injured by the admixture of the impure, and it was only by setting aside a little milk from each cow in a separate vessel that the owner was enabled to fix on the affected ones.

This unsusceptibility of the majority of the cows to the agent which all alike were swallowing, and the acquirement of this susceptibility by one after another at irregular intervals, demand investigation. One or two hypotheses may be hazarded on this subject.

1st. It may be held that the agent operated on the system after the manner of a specific fever-poison, of which an animal is not always receptive, but which, received into the body, will follow a regular course of increase and decline, and obtain for the subject an entire immunity from all future attacks of the same kind. This theory fails to account for the introduction of the solid germs through the healthy mucous membrane of the stomach. The duration of the disease, too, does not show that constancy which this explanation would demand. There was a considerable variation in the different cases which occurred at Ithaca. In a case reported by M. Verrier, Seine-Inférieure, France, occurring like this in a dry season, and in which the milk had the same viscid characters, being easily drawn out into threads, and in all probability contained a similar cryptogamic product, the affection lasted in the whole herd for four or five weeks.

2nd. Another theory, which I am more inclined to favour, would attribute the introduction of the spores into the circulation to some unusual or unhealthy state of the mucous membrane, whilst their elimination by the mammary glands, and probably by other secreting surfaces, was rendered possible by the fever and disturbance of the nutritive and secretory functions induced by their presence. The migration of blood-globules through the walls of the vessels into the interstices of surrounding tissues during congestion and inflammation, affords some clue to a satisfactory explanation. A cow which is suffering from a slight indigestion has the mucous membrane congested and the normal relations between its molecular elements impaired and deranged, and these minute bodies find a readier means of access to the blood.

The same explanation may apply to the presence of many other allied elements in the blood of animals in diseases, such as the *Bacteria*, common to many fatal disorders in

which the blood is very much depraved, and the various fungi to which Hallier and others attribute a pathogenic influence. By the general derangement of nutrition and the suspension of the concurrent exercise of function in the minute elements of the tissues, the natural barriers are removed and these extraneous and more or less hurtful elements find an easy entrance into the system.

In connection with this it may be interesting to note that in ruminants slaughtered in the most perfect health the epithelium of the rumen, and above all of the omasum, is frequently found to be but loosely adherent or even partially detached. There is some reason to believe that desquamation takes place from these organs at intervals, and without any perceptible interference with the general health; yet may not such a partial exposure of the dermis greatly facilitate the introduction of such solid bodies?

FATAL DOSE OF CHLORAL HYDRATE.

Dr. B. W. Richardson, F.R.S., has had reprinted from the British Association Reports for 1871 his own special report on the physiological action of organic chemical compounds. This is a most valuable and, we need not say, most interesting paper. It deals with several substances, and first of all comes chloral hydrate. He has endeavoured to ascertain what is a dangerous and what a fatal dose of chloral hydrate. The conclusion at which he has been able first to arrive on this point is, that the maximum quantity of the hydrate that can be borne at one dose bears some proportion to the weight of the animal subjected to its influence. The rule, however, does not extend equally to animals of any and every class. The proportion is practically the same in the same classes, but there is no actual universality of rule. A mouse weighing from three quarters of an ounce to an ounce will be put to sleep by one quarter of a grain of the hydrate, and will be killed by a grain. A pigeon weighing twelve ounces will be put to sleep by two grains of the hydrate, and will be killed by five grains. A guinea-pig weighing sixteen ounces will be put by two grains into deep sleep, and by five grains into fatal sleep. A rabbit weighing eighty-eight ounces will be thrown by thirty grains into deep sleep, and by sixty grains into fatal sleep. The human subject, weighing from 120 to 140 pounds, will be made by ninety grains to pass into deep sleep, and by 140 grains into a sleep that will be dangerous; finally, he concludes that a dose of 180 grains is a fatal dose.—*Journal of Chemical Society.*

Analysis of Continental Journals.

By G. Fleming, M.R.C.V.S., Royal Engineers.

THE PHYSIOLOGY OF VIRUS AND VIRULENT MALADIES.

By M. A. Chaveau.

(*Continued from p.* 509.)

I. *Of the method to be followed in determining Viruliferous elements.*

All who have sought for the cause to which virulent humours owe their specific activity, have commenced with attempting to discover their composition by chemical and microscopical analysis; and, no doubt, this primary initiation is absolutely necessary. But, in general, there is too much reliance placed upon the nature and importance of the results that may be obtained from this study. Starting with the idea that the specific activity of virulent humours *should* be due to the presence of chemical or organic elements equally specific, they are examined for elements which are nowhere else to be found, with the intention of attributing to them, and without any other supplementary evidence, the virulent activity with which they are endowed. We hasten to announce that this mode of proceeding, however ably conducted it may be, can produce no satisfactory result. Here is what I have to remark in the first place: no matter how carefully the analysis of pathological products may be made, it must be admitted that the most dissimilar humours often present the same characters as to their composition. This identity, certainly, may only be apparent, and be due to the relative imperfection of the procedure in chemical or microscopical analysis at our disposal; but it nevertheless has the same consequence as if it were demonstrated in an absolute manner. If a humour completely destitute of specific activity is found to be the same in composition as one that is virulent, it must be justifiable to renounce the idea of drawing from the comparative observation of these two humours the faintest indication as to the cause of activity in the latter.

But taking, for instance, the case in which a virulent

humour, when examined microscopically, appears to be distinguished by particular elements, would we be much more advanced because we had made out these elements? It would be necessary, at first, to prove that they had not been accidentally introduced; and all naturalists who have studied the question as to the atmospheric germs and their development in animal or vegetable infusions, know how difficult it is to evade the causes of error that this development imports into the study of the organisms proper to the physiological or pathological humours. Good observers have been deceived, and singular blunders have been committed.

If we were not limited as to time, and if I did not consider the task useless and superfluous, I might refer to the work which has had the most popularity among those that had the pretention of arriving at the determination of the virulent elements by microscopical analysis; we might together make a critical examination of this work, and I could show you a fine list of errors of this kind; you would see what aberrations may occur, even with the most learned in natural history, when questions in experimental medicine are studied without exact notions as to the exigencies accompanying the scientific demonstrations belonging to these questions.

Lastly, admitting that particular elements found in a virulent humour really and properly belong to it; for the simple reason that similar humours, taken from other diseases do not present the same elements, shall we be authorised in attributing to the latter the specific activity of the humour in which it is found? Assuredly not—and I will not even allow that this attribution may be a simple probability; for, strictly speaking, the same probability exists, *a priori*, for all the other constituent elements of the humour, inasmuch as it cannot be *directly* demonstrated that they are strangers to the activity of this humour.

Observation in such cases, no matter how perfect it may be, cannot yield more than in analogous cases. It orginates certain hypotheses in the mind as to the causes, or rather the conditions of phenomena. It is to experimentation that recourse must be had to transform to certainty the characters of probability of these hypotheses; a *direct demonstration*—one that is as complete as possible, and obtained by the rigorous application of the logical and technical procedure of the experimental method—is needed. The more the subject is delicate and difficult, the more exigent ought we to be in accepting the proofs which should constitute this direct demonstration. And can there be anything more difficult

and delicate than the determination of the intimate agents of virulence? No; therefore the necessity, in studying this subject experimentally, for exercising the greatest care in collecting the elements of the demonstration that this study furnishes. Everything is to be gained by this carefulness, everything to be lost by its neglect. In being too indifferent with regard to the positive proofs necessary to transform into demonstrated propositions certain hypothetical notions, we sometimes place a wrong value upon very interesting researches. Take, for instance, from among those works which are most closely allied to our subject, the important investigations of Davaine on the motionless bacteria of anthrax.

Are these bacteria, as Davaine maintains, the essential cause of, and the agents that transmit the disease to the animals experimented upon? I have no reason to doubt it; and you will find in the course of the conferences that I fully accept Davaine's interpretation.

Nevertheless, there is no more justification for affirming, in the scientific sense of the word, this interpretation, as it only rests on a single order of facts: those which show the parallel development of motionless bacteria and the symptoms of anthrax in the inoculated animals. If the inoculating matter contained nothing more than these elementary organisms, this would of course be a direct and peremptory demonstration of the part attributed to them; but it is not so. When anthrax blood is introduced beneath the skin of the animal, the creature is inoculated not only with bacteria but many other substances. Who knows that it is not to one of these substances that the production of anthrax is due? Who will prove that the multiplication of the bacteria is only a simple epiphenomenon? We shall have occasion to speak presently of a really virulent malady, with eventual development of bacteria in the inoculable fluids, in the blood itself; but in which these bacteria are absolutely foreign to the specific activity of the humour. Since we allude to this example, we cannot leave it without having exhausted all the sources of information it can furnish us with regard to the subject now under examination; and pointing out the necessity of applying, with the greatest rigour, the principles of the method which should preside in researches of this kind.

The author of the work on the bacteria of anthrax is too enlightened not to have perceived that his task had everything to gain by a peremptory demonstration of the important part attributed to these proto-organisms. The best course would doubtless have been to isolate these bacteria, and experiment

with them alone, and comparatively with the other elements of the anthracoid blood. But the difficulties attending the attempt to isolate them are enormous, perhaps insurmountable when tried directly. Davaine thought he had overcome the obstacles when he used the placenta of a pregnant animal to effect the isolation; his experiment is well-known and often cited. A female guinea-pig in a pregnant condition was inoculated with anthrax matter. After the death of the animal its blood was full of bacteria and capable of producing the disease by inoculation, but that of the fœtuses possessed neither of these features. There is no need to estimate the value this experiment may possess from this fact; it is a subject we shall have to discuss when speaking of the heredity of virulent maladies; so we shall only examine the interpretation that has been put upon the results by the experiment.

It is said, since of the two bloods inoculated with, that which contained the bacteria is alone inoculable; therefore it is that the bacteria are the agents that give the blood its anthracoid quality; the placenta, in arresting the maternal protoorganisms, hinders the fœtus from contracting the malady—two affirmations which have not the sanction of a direct demonstration, as is easily shown.

In order that the results of the experiment in question might indicate that the bacteria are the infecting agents in anthrax, it would be necessary to prove that the maternal and fœtal blood only differed in the presence or absence of these particles. But this has not been done; and the fact still remains to be demonstrated, just as if the blood had been obtained from two quite independent animals, one diseased the other healthy; one infected with the bacteria, the other exempt from these parasites. In this respect the experiment alluded to has added nothing to our knowledge of the actual elements of anthrax blood.

Is it more exact to admit that if the blood of the fœtus had not become anthracoid in this experiment, it was because the passage of the bacteria from the mother to its young was prevented by the placenta? But it is not only the bacteria of the maternal blood which cannot pass through the walls of placental vessels; the other tangible elements, such as the red and white globules, globulines, &c., are no less incapable of passing that barrier; the placenta offers the same impediment to them all, and there is nothing to authorise the opinion that one more than another is the contagiferous agent, and that its non-introduction into the blood of the fœtus prevents that fluid from becoming anthracoid. The experiment,

therefore, completely fails to clearly demonstrate what those are, among the elements of the blood, which possess the infecting aptitude.

This is, definitely, what this attempt to separate the active elements of anthrax by filtration of the blood through the placenta of pregnant animals is reduced to.

I have the same objections to make with regard to another tentative of Davaine's to isolate the anthrax bacteria. In this experiment the diseased blood is mixed with a large quantity of water, and allowed to stand for some time in a test-tube; the bacteria fall to the bottom, and the fluid above them is removed. Inoculation with the deposit at the bottom of the vessel produces anthrax, but that with the supernatant liquid does not. It will be remarked that this experiment can have no other signification than the preceding; for if the inoculable deposit contained anthrax bacteria, it also contained the other solid elements of the blood, except the hæmoglobin which the water readily dissolves. But again you cannot fail to observe that there is little more to be done, perhaps, in this very remarkable experiment than to cause the total destruction of all the normal elements of the blood, leaving the bacteria intact. The direct demonstration of the action of these bodies would then be placed beyond all dispute. We shall see what the future will do for us in this respect.

From these examples you will perceive how easy it is to be led to accept too readily the scientific proof of the determinations belonging to the order of facts under discussion. I have designedly borrowed these instances from a work which is worthy of esteem among those which treat of subjects analogous to own; and in doing so I shall have forewarned you against the danger to which we are exposed if we neglect to be careful in the choice and criticism of the proofs we have to make in order to arrive at the determination of the virulent agents.

Every means of demonstration should be had recourse to. We shall be aided by observation, but it is especially to the experimental method that we must address ourselves. No determination should be received if it cannot be based on a direct and rigorous demonstration.

Our first care shall be to determine in what physical condition the active elements of virulent humours are to be found; as it is only after having assured ourselves on this primary point, the most important of all, that we may inquire if it is possible to arrive at a more special determination of the virulent agent.

II. *Determination of the physical condition of virulent agents.*

With regard to the physical constitution of their component elements, all the virulent humours have characters more or less resembling those of the other pathological fluids, or even of the equivalent physiological humours. All, from the densest pulmonary nervous abscess to the clear transparent lymph of the vaccine vesicle or variolic pustule, are composed of a *liquid* and a *solid portion*, like the blood,—the prototype humour, and the source of all the others.

The *liquid portion* is sometimes a plasma analogous to, or even identical with, that of the blood and lymph. Like it, the plasma of the virulent humours has for its base or fundamental elements albumen and fibrogeneous matters, which coagulate spontaneously when removed from the organism and form fibrine. This coagulability is frequently found to be most marked in those humours which are engendered by lesions developed in the midst of the tissues; while the virulent humours, or mucus poured out on the surface of organs, are, on the contrary, generally destitute of this character, or at least do not readily show it. Most frequently, when we examine the fluid portion of virulent humours, the coagulant action has deprived it of the characters of a plasma; so that it is only exceptionally that this name can be applied to it. In general, the liquid element of the virulent humours shall be designated as the *fluid* or *serous portion* or *serum*.

The *solid portion* comprises the elements held *in suspension* in the liquid part. These are more or less voluminous cells, white globules, molecular granules, and proto-organisms. They will be termed, in common, *solid elements, corpuscular substances, corpuscles*, and *definite particles*, to distinguish them from the matters *in solution* which form the base of the plasma or serum.

Is it in the substances *in suspension* or those *in solution* that the virulent property is fixed? The answer to this question contains the determination of the physical condition of virus, and we will see that this response should be in favour of the substances in suspension. Three orders of facts will enable you to decide that the specific activity belongs to the solid elements of the virulent humours, and that the serum has no participation in this activity.

1. In experimenting with the virulent humours, gradually and progressively diluted in an inert vehicle, their activity is manifested not as if it were uniformly distributed in the whole mass and belonged to all the molecules, but as if it were the exclusive attribute of some of these molecules dispersed here

and there, and as much more distant from each other as the dilution is increased.

2. The substances dissolved in the serum, and withdrawn *separately* from the humours, are shown to be completely destitute of all virulent activity.

3. The same isolation being practised on the definite particles suspended in the serum, inoculation with them, when isolated in an absolute manner, produces the same effects as those resulting the entire humour.

A.—Influence of the dilution of Virulent Humours on the manifestations of their activity.

Everyone knows the celebrated experiments by which the illustrious physiologist, Spallanzani, demonstrated that the fecundating property of the semen does not reside in the elements of its fluid portion, but that the spermatozoa which move about in it in such prodigious quantity are the agents to which it owes its specific activity. Among these experiments is one which seemed to me likely to furnish the elements of a *probable* solution of the physical condition of the actual agents of virulent humours, and it is by this primary tentative that I will inaugurate my demonstrations.

It is known that Spallanzani, being possessed of the idea of producing the artificial fecundation of fish ova with semen diluted in water, discovered: 1st, that the relatively weak dilutions acted like pure semen, all the ova sprinkled with the liquid becoming impregnated and developed; 2nd, that with the dilutions carried to a high degree, only a certain number of ova were fecundated, although all were saturated in the same manner by the fecundating fluid. Such a result could only be explained by admitting that the fecundating property was the appanage of particles dispersed here and there in the fluid; the ova which met them were impregnated, and those which did not remained sterile. If the activity of the semen resided in the substances in the liquid condition, in the matters dissolved in the water, all the liquid molecules would necessarily possess this activity *to the same degree;* so that in every case, with the weak as with the strong dilutions, or even with the pure semen, impregnation would be manifested *in an equal manner*. It is because it is not so that we determine to ascribe the fecundating faculty to the corpuscular elements of the spermatic humour. Evidently this is not a direct and peremptory demonstration; but among the indirect proofs of the part played by the spermatozoa there is none more eloquent or significant.

I asked myself if the benefit of such an experiment could not be applied to the demonstration of the physical conditions of the active elements of the virulent humours; as these exhibit definite particles floating in a plasma or serum, like the spermatozoa in the liquid portion of the semen. Dilutions more or less extensive should act on these humours in the same manner as with the spermatic humour: separating the particles suspended in the serum more or less from one another, but not interfering with the homogeneity of the fluid portion. So that if we took a series of very fine drops from a virulent humour thus diluted there would exist, in the same degree of dilution, the substances dissolved in the semen; but so far as the corpuscular elements were concerned there would not be the same identity of composition in the drops. If the quantity of water added to the virulent humour is considerable, if the corpuscles are consequently removed farther from each other, the drops will not contain them all, and the number of those which shall be without them will have all the more chance of being great as the dilution is carried to a higher degree. And if we inoculate with a comparatively notable quantity of these drops, realising for all the inoculations identical conditions, we may assure ourselves if these drops have exactly the same activity. If they have, then the result will be favorable to the attribution of the virulent faculty to the liquid portion of the humour; but if they have not, then it will be conformable to what was obtained with the spermatic dilutions, and it might be affirmed that the virulent property belonged to the solid portion.

(*To be continued.*)

THE MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

Official Report.

The annual meeting of the Midland Counties Veterinary Medical Association was held at the Midland Hotel, Derby, on Tuesday, July 23rd, 1872, the President, F. Blakeway, Esq., Stourbridge, in the chair. There were also present Messrs. Proctor, Coventry; Pyatt, Nottingham; Carless, Stafford; Perrins, Worcester; Cresswell, Broomsgrove; Taylor, Manchester; Greaves, Manchester; Flower, Derby; Rossell, Sandiacre; Bailey, Leicester, &c. &c. Letters of apology for non-attendance were read from

several members. The minutes of last meeting were read and confirmed. The next meeting was arranged to take place at Birmingham in November.

The *President,* in delivering the inaugural address, said,—Gentlemen, when I first occupied this chair and had the privilege of addressing you as President at Birmingham in August last, I little thought I should be called upon to perform the same duty here to-day. I feel deeply the responsibility of the situation as well as honour you have conferred upon me, and I promise to endeavour to discharge the duties which devolve upon the President to the best of my ability and the benefit of the Society. Last year I reviewed our present and past condition, glancing slightly at the objects of our Society and its future prospects, and although I feel we have achieved something during the past year, the progress has not been sufficient to warrant my adopting the same course to-day. I shall therefore briefly allude to some of the leading topics of our profession, and those that to my mind most deeply interest us as a body. First comes the startling obituary of the past twelve months. Here we see the old and the young taken from among us; he who had just commenced the career of life, as well as he who wore on his brow the hard-earned laurels of victory. The list is far too numerous for me to even glance at each individual's worth; but I cannot refrain from making a few general remarks, and drawing attention to one or two names. Foremost of all I would place the late Professor Spooner. By his death the profession lost one of its ablest supporters and brightest ornaments, one who in quick perception and practical knowledge none could surpass; and one who, as a lecturer, few could equal; but while we lament his loss we must all regret that a man of such sound judgment, and wonderful powers of expression, should have left nothing to veterinary literature. However, the name of Spooner will long be remembered, and we must admit that he has left in the profession many living witnesses to his worth as a professor and a teacher. I shall mention two other members only, whose deaths are recorded in the *Veterinarian* of April last, viz. J. Rose, late of Worcester, and W. Robinson, late of Tamworth. The latter graduated in 1806, the former in 1815, and both lived beyond the allotted span of human life. Both were intimately known to me, and none were more deservedly respected in the counties in which they practised. In reading the record of their death I felt that some respect was due to the memory of Mr. Rose, for while we must all be pleased that any member of the profession should have such tribute paid to his memory as the late Mr. Robinson has had, surely the man who has worked hard in the profession upwards of sixty years is worthy of some little passing remark; and

while I highly commend what is being done in one case, I cannot go so far as our friend Mr. Burley did in his strictures upon us as a body, at the meeting at Tamworth. Doubtless we owe a deep debt of gratitude to those gentlemen who kindly undertake to fill important offices in our profession—offices that entail considerable loss of time, much expense, and anxiety, with often but little thanks—still let us not forget those who labour hard in private life, and who by high professional attainments and untarnished character are doing much, "although that work is carried on silently," to elevate the standard of their profession; such a person was the late Mr. Rose, and such, I am proud to believe, are many others still working among us, who, when called away, will surely be deserving of our respect and esteem.

I pass on to our body generally, and ask what position do we occupy as a profession? and I am bold enough to answer, never did the veterinary profession of Great Britain stand in so favorable a position to itself, or in so great estimation in the opinion of the public as at the present time. If it is still to progress rests entirely with ourselves; the public look more to and expect more from the veterinary surgeon than ever they did. Take as an instance the increasing number of examinations which pass through our hands. Formerly it was the exception that purchasers of horses should have them examined; now it is the exception that they purchase a horse without consulting their veterinary surgeon; in fact, my experience tells me that our advice is more generally sought after than ever it was, and that in society we rank higher than ever we did; and why is this? I hold that the veterinary surgeon of the present day is more highly educated, and in private life more discreet than he was wont to be. In making these remarks, gentlemen, I apply them to our body, and not to individuals. I am well aware that, from the earliest date, there have been those who not only ranked high in society, but also in scientific attainments; and instead of wishing to pull down all that is old and set up only that which is new, I may say for myself that no man venerates the gray hairs and respects the opinions of age more than I do. If it had not been for our predecessors and their labours, the veterinary profession could never have occupied its present position—a position, however, that we must not be content with.

Excelsior must still be our cry, and that this is generally felt—witness the doings of our councils and colleges. Never has there been in one year such great and good reforms effected as during the past; the alterations and additions, both in the curriculum of study, and also in the facilities offered to the pupils, are highly commendable; and if the student of the present day has greater demands made upon him, the advantages placed before him far

outweigh the extra labour. Could he only contrast the college advantages of the present day with what they were twenty or thirty years ago, he would be inclined to feel the difference between the men of that day and the present should be more marked than it is. There is one part of the present education which, although the college is still trying to increase it, is still to my mind far behind any other; I mean practical teaching. I am told by an old and present examiner that more pupils are rejected on the subject of practical knowledge than on any other. Right gladly would I hail the day when the apprenticing clause was put in force, for without it, this will always be a stumbling-block to the progress of many a young practitioner, who, commencing life, as it were, with only scientific and theoretical knowledge, often becomes disgusted with the ridicule and almost contempt which he daily encounters, so much so, indeed, that he is not unfrequently induced to give up the profession in despair. I am almost inclined to view the education of the present day, without all due care be taken, as being likely to raise shoals to strand our little boats upon. Men or even women too highly educated are frequently too apt to look on many necessary duties of life as too menial for their exalted state; and, gentlemen, I fear it may be so with some of the present aspirants to veterinary science. A greater mistake was never made, for unless the veterinary surgeon is not only able, but willing, to perform at times the work his profession requires, he, as far as success is concerned, had better never have entered it. Depend upon it, a man able to give sound advice, and with tact and quickness not only to order others, but able himself, if wanted, to carry out the details of his profession, will make a more lasting impression on the mind of his employer, and secure the respect of the subordinates around him, than theorizing for hours on the nature of disease.

And now, I may ask, what have we to do? Are we to sit still and calmly watch the progress with satisfaction? No, gentlemen, the common laws of society demand that we, too, should work. There should be no drones in the hive; each and every one can aid the cause. Not only the man who exercises his calling in the large towns of our land, but he also who is shut up in the out-of-the-way country districts, and especially can this be done through the medium of such societies as this. It is a fallacy to think that these meetings are only for the purpose of discussing scientific subjects; and blind indeed must that man be who holds we have no right here to advocate reforms, or call in question the acts and doings of those who represent us. Just as absurd would it be to expect that the constituents of a county or town should never question the doings of their Members in

Parliament, or endeavour in any way to influence their actions. Still, if we are liberal enough to wish and demand reform, let us be conservative enough to expect reform to be gradual; believing that steady progress and well-matured measures will survive the test of time, while rash and hasty endeavours can only bear resemblance to the little bubble blown by the child, which rises and flitters for a moment, and then vanishes away.

The circular received from the North of England Association, and discussed at our last meeting, indicates to my mind that a feeling akin to that which I have endeavoured so feebly to lay before you actuates our brothers of the North. If we can only get our societies to act in concert and with spirit, not only should we be able to obtain at all times and on all subjects the opinions of the profession, but we should form such a phalanx of strength as would resist all encroachments on our rights as a chartered body, and make reform comparatively easy. The scientific discussions at these meetings have always been a great feature, and while we thank those who from time to time have so kindly introduced papers and specimens of interest, let us ask them to still continue to do the same, and in the discussion that follows let each endeavour to take a part. It is not because you or I hold certain views of disease, and adopt certain plans of treatment, that we are therefore right. We may find on comparing notes with others, that if not all abroad, we are far behind in some of the minor details of practice. Let him also who is able to attend the annual meetings of our college, support only those who have the interest of the profession at heart, and who will also regularly discharge duties that devolve upon them. By these means we shall show to the professional world that we are earnest and sincere in our desire for progress, and that whatever subject comes before us, that by calmly, fairly, yet freely and fearlessly, discussing it, we shall establish such a fellowship among our members, and such a unanimity of sentiment and feeling among our body, as shall make the motto of our college not a dead letter, but a reality.

After the address the members adjourned to another room, where the annual dinner took place. The usual loyal and other toasts were given, and thus terminated a most pleasant and profitable meeting.

M. Palfrey, *Hon. Sec.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

The usual quarterly meeting was held at the Queen's Hotel, Leeds, on Wednesday, the 31st July, the President, Mr. John Cuthbert, in the chair. The following members were present:—viz. Messrs. Greaves, Naylor, James Freeman, Nicholson, Edmundson, Anderton, Patterson, Carter, Fallding, Walker, Pratt, Fearnley, Ferguson, and the Secretary.

Mr. Westerman was present as a visitor.

Apologies for non-attendance were received from Messrs. McTaggart, Freeman, Joseph and John Bale.

The minutes of the previous meeting were read and confirmed.

Mr. Fearnley read a paper "On the Use of Chloroform with Morphia in Bowel Diseases," which elicited a very spirited and instructive discussion, in which most of the members took part.

Mr. President and Gentlemen,—I have great pleasure in bringing before you this essay on "The Use of Chloroform with Morphia in Bowel Diseases." For three or four years I have been in the habit of using morphia subcutaneously, and chloroform by the mouth or by inhalation, as valuable adjuncts to our ordinary remedies, with great success.

I am sure you will all agree with me when I say that our patients die from shock or from nervous exhaustion in nearly all fatal bowel diseases, and the rapidity with which they die often astonishes us.

Excepting spasmodic colic, we cannot regard these powerful agents as remedies *per se*, but they do so nurse the system until our other remedies have time to act, or nature to regain her healthy equilibrium, that, properly applied in good time, they render the chances of our patient dying (excepting through organic lesion) exceedingly remote.

Considering long essays a nuisance and uncalled for, and further bearing in mind that you are all experienced in ordinary remedies, I will go on to state that after we have diagnosed the nature of the particular form of the disease we are called upon to treat, if there is distressing pain after giving suitable medicine, we should at once proceed to give our patient that which he would receive were he undergoing the same amount of pain by a surgical operation. Before going further let us suppose that we were about to perform an operation causing so much pain as to risk losing our patient from collapse within a few hours. Should we or should we not give something to obviate this? Again, who doubts that most of the bowel diseases of horses which prove

fatal are attended with as much pain as in any operation that can be performed, only in one we have the pain extending over half an hour, while in the other extending over, it may be, several hours. If, then, we agree in condemning pain as the cause of death in bowel disease, it is clear that it ought to receive our earliest attention.

Before describing the mode of giving the morphia and chloroform, allow me to narrate a case in point, the like of which you will all agree usually proves fatal.

One Sunday last March I saw a horse, about four miles from here, about one o'clock at noon. He was down on a large bed of straw outside the stable. He was an aged brown horse—age probably twenty—in fair working condition. At seven o'clock that morning he began to be uneasy, and this increased until he was so frantic with pain, that they made a large bed for him outside the stable. He was not swollen in the body, the visible mucous membranes were not much injected; his pulse was about 60, and very good; his temperature was $101\frac{3}{10}^{\circ}$; his breathing was 25; and he looked a good deal at his flanks. Here was a clear case of obstipation, which would most likely, in spite of me, run on to inflammation of the gut at the obstruction, and kill the horse within twenty-four hours. I first gave him suitable remedies to remove the obstruction, such as a brisk aloetic purge in a fluid form, &c.; then I injected, subcutaneously, twelve grains of muriate of morphia, and, in fifteen minutes after, put him to sleep with a few draws of chloroform (inhaled). I left two ounces of chloroform, some to be given, if requisite, by the mouth.

I saw the horse next morning. He was still down, looked frequently at his flanks. Pulse 90, and wiry; temperature 106°, and with the remainder of the symptoms of enteritis. He was treated as on the previous day, nearly.

On the third day (Tuesday) he was still down, and with temperature and pulse no worse, but no better than on the previous day. The chloroform with morphia was kept up, and so on.

On the fourth day, at noon (Wednesday), he rose and was purged (the fæces being most offensive). After being nursed for a fortnight he was very well, but still weak; then he regained his usual strength and flesh. Here this horse would be half unconscious during that stage of the disease which kills. The medicine had time to remove the obstruction during this bridging over of the painful stage.

And now as to the *modus operandi*. About two years and a half ago it was discovered simultaneously by Mr. T. Pridgin Teale, of this town, and another surgeon—I forget who—that when morphia is in the system a much smaller amount of chloroform is

required. This is important. In severe operations and in excessively painful affections I inject from five to fifteen grains of the muriate of morphia under the skin between the forelegs, and in about a quarter of an hour afterwards I either cast the horse with hobbles, or by Mr. Rarey's method, and pour chloroform (a few drops at a time) over one thickness of cotton or muslin held tightly over one nostril, while I keep the other nostril closed. The largest horse is rendered utterly insensible by a few draws, never more than an ounce, of chloroform, and kept in that condition at pleasure. The chloroform in much larger quantities may be given by the mouth, mixed with a little cold gruel. Death from bowel diseases are very rare with me, wholly, I believe, on account of this treatment.

In conclusion, let me just say that the sudden deaths from asphyxia which we meet with in the distended stage of acute indigestion cannot, and we cannot expect it, be obviated by this means.

Mr. Naylor moved, and *Mr. Nicholson* seconded, a cordial vote of thanks to the essayist.—Carried unanimously.

It was arranged that the next meeting should be held in October, when Mr. J. H. Ferguson, of Leeds, has kindly volunteered a paper for discussion.

WILLIAM BROUGHTON, *Hon. Sec.*

THE LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE thirty-third quarterly meeting of the Liverpool Veterinary Medical Association was held in the Medical Hall, Hope Street, on the evening of Friday, the 9th of August, 1872.

Owing to the fact that there was no paper for discussion, there was a very scant attendance, and the only members present were —Messrs. Storrar, President; R. S. Reynolds, T. Roberts, C. Elam, N. Whittle, T. Greaves, and the Secretary.

After tea the chair was taken by the President, and an agreeable evening spent in the discussion of veterinary politics, viz.:

1st. As to whether the examiners ought to be elected from members of our own profession?

Answer—An unanimous *Yes*.

2nd. Is it advisable that an examiner once elected retain that seat for life?

Answer—An unanimous *No*.

The question of the division of subjects for study to separate sessions, and ascertaining proficiency by examination, and granting a diploma in said subjects, also received a fair amount of discussion, and was very generally approved.

Charles Middlehurst was unanimously elected a member.

The meeting terminated at an early hour. The annual meeting will be held in the above Hall in November. Tea will be provided at 5·30 p.m. Members of the Association and the profession are earnestly invited to attend to take part in the discussion of the important subjects likely to occupy the attention of the meeting.

W. Chambers Lawson,

Hon. Sec.

CATTLE PLAGUE—ORDER IN COUNCIL.

At the Council Chamber, Whitehall, the 7th day of September, 1872. By the Lords of Her Majesty's Most Honorable Privy Council. Present—Marquis of Hartington, Mr. Forster.

Whereas the contagious or infectious disease known as Cattle Plague or Rinderpest has appeared in the East Riding of Yorkshire; and whereas it has become expedient to make further provisions for better preventing the spreading of this disease in Great Britain:

Now, therefore, the Lords and others of Her Majesty's Most Honorable Privy Council, by virtue and in exercise of the powers in them vested under The Contagious Diseases (Animals) Act, 1869, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:—

1. This Order shall take effect from and immediately after the eighth day of September, one thousand eight hundred and seventy-two, and shall continue in force till the first day of December, one thousand eight hundred and seventy-two.

2. This Order may be cited as The Cattle Plague Order of 1872.

3. This Order extends to Great Britain only.

4. In this Order—

District means the district of a Local Authority:

A defined part of a port means a part of a port defined by a special Order of the Privy Council, in pursuance of Regulation 2 of the Fourth Schedule to the Act of 1869:

Other terms have the same meaning as in The Contagious Diseases (Animals) Act, 1869:

5. The holding of all markets, fairs, exhibitions, or sales of cattle within the City of York and within the East Riding of Yorkshire,

and all the boroughs therein, is hereby prohibited, except under licence of the Privy Council.

6. The movement of cattle within the City of York and within the East Riding of Yorkshire, and all the boroughs therein is hereby prohibited, except by licence, and in accordance with the provisions contained in Article 9 of this Order.

7. A Local Authority may, from time to time, with the view of preventing the introduction or the spreading of Cattle Plague within their district, make regulations for the following purposes, or any of them:—

(1.) For wholly prohibiting, or for prohibiting except by licence, the movement into their district of cattle from the district of any other Local Authority: Provided that any such prohibition or regulation shall not restrict the moving of any animal or thing by railway through or out of their district, such animal or thing not being stopped within their district:

(2.) For prohibiting the holding of all markets, fairs, exhibitions, or sales of cattle within their district, except as follows:—

a. Cattle belonging to the owner or occupier of premises not in an Infected Place may be sold on those premises if the cattle are not affected with Cattle Plague, and have been on those premises in possession of the owner or occupier thereof, not less than twenty-eight days immediately before the sale.

b. Cattle within a defined part of a port, which have been delivered to the owner or his agent, may be sold within such defined part.

c. Markets, exhibitions, and sales may be held under licence of the Privy Council.

(3.) For prohibiting the movement of cattle within their district, except by licence.

If any cattle are sold, or exposed or put up for sale, or exhibited in contravention of this or any other Order of Council or of any regulation made by a Local Authority under this Article, the seller and the purchaser thereof, and the auctioneer putting the same up for sale, or the person exposing the same for sale or exhibiting the same, shall each be deemed guilty of an offence against this Order; and if any person holds a market, exhibition, or sale, in contravention of any such Order or regulation, or fails to comply with any of the conditions, provisions, or regulations of any licence for the holding of a market, exhibition, or sale, he shall be deemed guilty of an offence against this Order.

8. Cattle exposed for sale in a market or at a sale, the holding whereof for the sale of cattle for immediate slaughter is licensed by the Privy Council, may be kept alive for a period of six days after such exposure, and no longer.

If any person keeps any cattle alive in contravention of this Article, he shall be deemed guilty of an offence against this Order.

9. Where the Privy Council or a Local Authority have made a regulation prohibiting the movement of cattle into, or within any district except by licence, cattle may be moved in accordance with the following provisions, but not otherwise, namely :—

(1.) No cattle within the district shall be moved on a highway between sunset and sunrise during this month of September, or between the hours of 6 p.m. and 6 a.m. in the months of October and November next; but nothing in this Article shall restrict the movement of cattle within the limits of any city or town.

(2.) Licences for movement of cattle shall be of three kinds.

a. A licence for movement generally, to be called a Movement Licence:

b. A licence for removal to a licensed market, exhibition, or sale, to be called a Market Licence:

c. A licence for removal from a licensed market, exhibition, or sale to be called a Market Pass.

(3.) The forms in the Schedule to this Order, or forms to the like effect, signed as in that schedule directed, shall be used in the cases to which they refer, with such variations only as circumstances require, and when used shall be deemed sufficient within the district in which they are issued: Provided that in the case of the Market Licence, a certificate of a Veterinary Inspector of the Privy Council, under the first provision of Article 15 of The Foreign Animals Order of 1871, may accompany such licence, in lieu of the declaration of the owner or his agent, which is annexed thereto in the form given in the schedule.

(4.) No cattle shall be moved out of the district in which they are, except with a licence of the Local Authority; and if that licence is not signed by a Justice of the Peace, then there shall also be requisite a licence of the Local Authority of the district into which they are to be moved, indorsed on or referring to such first-mentioned licence; but such secondly-mentioned licence shall not be necessary in the case of movement from lands to other lands in the same occupation, situate in the district into which the cattle are moved, within five hundred yards of the boundary of the district out of which they are moved: Provided that no licence for movement shall be available for movement into the district of any Local Authority, if such Local Authority have made a regulation wholly prohibiting such movement.

(5). No cattle shall be moved within the district without such licence as the Local Authority of the district prescribe in that behalf; provided as follows:

a. The conditions of any such licence shall not be more stringent than the conditions of the Licences, forms whereof are given in the Schedule to this Order.

b. No regulation of a Local Authority shall authorise the owner or purchaser of any cattle, or his bailiff or agent, to consent by his signature or other act to the movement of such cattle.

c. No licence shall be necessary for movement within the district for a distance not exceeding five hundred yards from lands to other lands in the same occupation.

(6.) Cattle may be moved to a market, exhibition, or sale, licensed by the Privy Council, with a Market Licence or a Market Pass, but not otherwise; and the person bringing any cattle thereto shall deliver the Licence or Pass to an officer of the market, exhibition, or sale, or to some other person appointed in that behalf by the holders of the market, exhibition, or sale, and the same when so delivered shall be retained, numbered (for identification), and carefully preserved by such officer or person, and shall be produced on demand to an Inspector of the Privy Council, or an Inspector or other officer of the Local Authority, or to any police officer; and any person refusing so to produce the same shall be deemed guilty of an offence against this Order: Provided that, in case of an exhibition or sale, such a Licence or Pass shall not be given except for movement from places or parts allowed in the Licence of the Privy Council for the holding of the exhibition or sale.

(7.) Cattle which have been sold or exposed for sale or exhibited in or at a licensed market, exhibition, or sale, shall not be moved therefrom, except with a Market Pass, to be given by an officer of the market, exhibition, or sale, or other person appointed in that behalf by the holders of the market, exhibition, or sale, to the owner or purchaser desirous of moving the same.

(8.) Where a licence for the movement of cattle has been granted, and an error is afterwards discovered therein, any two justices may by writing under their hands subscribed to or indorsed on the licence, correct the error, and thereupon the licence shall be and be deemed to have been as valid and effectual as if the error had not been made.

If any cattle are moved in contravention of any of these provisions the owner thereof, and the person directing or permitting their removal, and the company or persons removing or conveying them, shall each be deemed guilty of an offence against this Order.

(Signed) Arthur Helps.

THE SCHEDULE.

* No.

Dated this day of 1872.

From the premises of

of in the county

or borough of

to in the county

or borough of

by the following route:

From

Through

To

Number of cattle

Description of ditto

(Signed)

* This number must correspond with that on the licence.

This counterpart is to be retained by the person granting the licence.

Caution. — Persons fabricating or altering or committing other offences with respect to licences are liable under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

Movement Licence.

* *No.*

I, *A.B.*, of , one of her Majesty's Justices of the Peace [*or* being a person appointed by the Local Authority of the of to grant licences for the movement of cattle (*a*)] hereby license the removal of the under-mentioned cattle from the premises of of in the county [*or* borough] of to at in the county [*or* borough] of . And I certify that the said premises are not within an infected place, and I grant this licence after satisfying myself that no case of Cattle Plague has existed on the said premises or within one mile of the outward boundary of such premises within twenty-eight days immediately preceding the date of this licence. This licence will be available for (*b*) days from the date hereof, *and no longer*, and no cattle can be moved under it on any highway, not being within the limits of any city or town, between sunset and sunrise, in the month of September, 1872, or between the hours of 6 p.m. and 6 a.m. in the months of October and November, 1872.

Dated this day of , 1872.

Number and Mark of Cattle.	Breed.	Age.	Description of Cattle.	Route (*c*).
				From Through To

(Signed)

at in the parish or of

in the county or borough of

No cattle can be taken to a market, exhibition, or sale *with this licence.*

* This number must correspond with that on the counterpart.

(*a*) This licence may be granted by the local authority of the place from which the cattle are removed, or any person appointed by such local authority to grant such licence; but is not available for the movement of cattle into the district of any local authority who have wholly prohibited the movement of cattle into their district.

(*b*) To be filled up with a number not less than three or more than fourteen.

(*c*) Describe route. If the cattle proceed by highway, they must not pass through, or within a mile of the outward boundary of, any infected place, except to enter a place in which they are to be slaughtered.

Caution.—Persons fabricating or altering or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

* No.

Dated this day of 1872.

From to

market, exhibition, or sale, in the

county *or* borough of

by the following route:

Number of cattle

Description of ditto

Name of seller or owner

Name of drover

(Signed)

* This number must correspond with that on the licence.

This counterpart is to be retained by the person granting the licence.

Caution.—Persons fabricating or altering or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

Market Licence. (*a*)

† *No.*

I, of in the of , one of Her Majesty's Justices of the Peace, [*or* being a person appointed by the Local Authority of the of to grant licences for the removal of cattle to markets, exhibitions, or sales,] the declaration annexed hereto having been signed by the declarant in my presence, [*or* the accompanying certificate of a Veterinary Inspector of the Privy Council having been produced to me,] hereby license the person under-mentioned, being the seller [*or* owner] of the under-mentioned cattle, or his [*or* her] agent, to move the said cattle from to market, [*or* exhibition, *or* sale,] in the of by the under-mentioned route, provided that the said cattle shall not be driven through any infected place, or within one mile of the outward boundary of such place. This licence will be available for (*c*) days from the date hereof, *and no longer*. But no cattle can be moved under it, on any highway, not being within the limits of a city or town, between sunset and sunrise, in the month of September, 1872, or between the hours of 6 p.m. and 6 a.m. in the months of October and November, 1872.

Number, Description, and Mark of the Cattle.	Name and Address of *Seller* or *Owner*, or his or her agent.	Route to be taken (*b*).	Market, Exhibition, or Sale, to which such Cattle are to be sent.	Name of Drover.
		From Through To		

(Signed)
, at
in the aforesaid.

Dated this day of 1872.

(*a*) This licence is necessary for the movement of cattle to a licensed market, exhibition, or sale, and may be granted by the local authority of the place from which the cattle are removed, or any person appointed by such local authority to grant such licences, but is not available for the movement of cattle into the district of any local authority who have wholly prohibited the movement of cattle into their district.

(*b*) Describe route. If the cattle proceed by highway, they must not pass through, or within a mile of the outward boundary of, any infected place, except to enter a place in which they are to be slaughtered.

(*c*) To be filled up with a number not less than three or more than fourteen.

† This number must correspond with that on the counterpart.

Caution.—Persons fabricating or altering or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

Dated this day of 1872.

Declaration of *A.B.* of

in the

This counterpart is to be retained by the person taking the declaration.

Declaration of Owner or his Agent.

Declaration to accompany Market Licence for the Movement of Cattle.

(To be annexed to the foregoing market licence, and not detached therefrom.)

I, *A.B.*, of in the of do hereby declare that the cattle which are proposed to be moved under this licence are free from Cattle Plague, and that no case of Cattle Plague has, within the two months immediately preceding my making this declaration, existed upon the premises from which I desire to move such cattle, or within two miles of the outward boundary of such premises. And I further declare that the said cattle have not, during the 28 days immediately preceding my making this declaration, been in contact with any animal suffering from Cattle Plague. I also hereby declare that I have not now any licence available for the movement of the said cattle.

Dated this day of 1872.

Signed by [*Declarant*].

This declaration must be made by the owner, or his agent, in the presence of the Justice or other person granting the licence, and must be annexed to the licence, and not detached therefrom, but is not required where the certificate of a Veterinary Inspector of the Privy Council under the first provision of Article 15 of the Foreign Animals Order of 1871, is produced.

Caution.—Persons making false declarations or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

* No.

Dated this of 1872.

Name and address of owner or purchaser . .

Number of cattle

Description of ditto

Name of drover

Route

From

Through

To

(Signed)

* This number must correspond with that on the pass.

This counterpart is to be retained by the person granting the pass.

Caution. — Persons fabricating or altering or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

Market Pass (a).

* No.

Market [*or* exhibition, *or* sale] in in the county of

Dated this day of 1872.

I hereby certify that the following cattle are [the whole *or* part] of those brought to this market [*or* exhibition *or* sale], from under the licence numbered , and retained by me, and I hereby license the said cattle to be moved to by the under-mentioned route:

Number and Description of Cattle.	Name and Address of the Owner or Purchaser, or his or her Agent.	Route (*b*).	Name of Drover.	Remarks.
		From Through To		

The time allowed for the removals under this licence is (*c*) days, from and after to-day.

[No cattle can be moved under this licence upon any highway not being within the limits of any city or town between sunset and sunrise, in the month of September, 1872, or between the hours of 6 p.m. and 6 a.m. in the months of October and November, 1872.]

(Signed)

Appointed to receive licences and grant passes in the above-named market [*or* exhibition, *or* sale].

* This number must correspond with that on the counterpart.

(*a*) This licence can only be granted by the person appointed by the local authority of the place from which the cattle are removed to grant such licences in the particular market, exhibition, or sale, but is not available for the movement of cattle into the district of any local authority who have wholly prohibited the movement of cattle into their district.

(*b*) Describe route. If the cattle proceed by highway, they must not pass through, or within a mile of the outward boundary of, any infected place, except to enter a place in which they are to be slaughtered.

(*c*) To be filled up with a number not less than three or more than fourteen.

Caution.—Persons fabricating or altering or committing other offences with respect to licences are liable, under The Contagious Diseases (Animals) Act, 1869, to fine or imprisonment.

Veterinary Jurisprudence.

NORWICH GUILDHALL.

SECONDARY ATTACKS OF FOOT-AND-MOUTH DISEASE—A NEW EXCUSE FOR NON-COMPLIANCE WITH THE CONTAGIOUS DISEASES (ANIMALS) ACT.

JOHN TARR, of Derby, cattle dealer, was summoned for exposing for sale on Norwich Hill, on Saturday, August 24th, one bull afflicted with the foot-and-mouth disease. Mr. W. L. Mendham prosecuted.

Mr. W. Smith, the Inspector appointed under the Contagious Diseases (Animals) Act, stated that on Saturday, August 24th, he saw a number of bulls, fifteen in all, belonging to the defendant, in the Cattle Market. The whole of these he examined, and found that one had the foot-and-mouth disease, and the others had all passed through the disease. The defendant was present during the examination, and witness directed his attention to the mouth, which plainly showed the disease. The fourteen which had recovered were still a little lame. They would not be capable of communicating the disease. In the one that was diseased the vesicles had not broken, and some were but imperfectly formed. Supposing the animal had had the disease and recovered about seven weeks previously it might again take the disease; but it was rare for an animal to have a second attack so soon. The fourteen others were liable to take the disease a second time from the one in question.

Mr. F. Low, Veterinary Surgeon, corroborated, and said the bull had had the disease from twelve to twenty-four hours. The animals that had had the disease were not so liable to take the disease from this bull as if they had never had it; but they might take it a second time. The defendant said that the bull had had the disease about seven weeks previously, and he was not aware that it was liable to have it again so quickly. He was quite unaware that it was suffering from the disease.

Mr. Blake said such an excuse was preposterous. Such men as defendant were acute enough in buying and selling, and it was useless to say that he was ignorant of the beast being diseased. It was owing to such practices that the disease was spread throughout the length and breadth of the land; and the markets ought to be closed against such men as the defendant, who bought and sold with such recklessness. In his opinion the Bench ought to inflict a penalty for every one of the fifteen beasts. The Bench fined the defendant £5, and £1 19*s.* 6*d.* costs.

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Communications and Cases.

OPENING OF THE WINTER SESSION AT THE ROYAL VETERINARY COLLEGE, OCTOBER 1st, 1872.

Sir James Tyler, Vice-President, in the Chair.

Professor Brown—There are two words, sir, in very common use in our profession, which ought to be connected very closely in meaning and intention, but which somehow have got to be quite antagonistic—practice and science. In the popular idea, practice means manual dexterity, power to do whatever rough work one happens to meet with in the world. Science, in the same view, refers to that higher kind of knowledge which the student acquires in his library, his laboratory, or his museum, and the world has become accustomed to the idea of disassociating the man of science from the man of practice, holding that the one who knows most is commonly capable of doing the least. The subject is an old one of controversy in our profession, and if I select it for my theme this morning it is under a strong conviction that a needless difficulty has been created, which in the interests of the student and the teacher should be removed.

Not to encumber ourselves with any needless difficulty, let us at once decide what we always mean by a "practical" man, and what always by a "scientific" man; and if I delineate these two pictures for you, let me have the credit of giving the most favorable representation of each.

The "practical" man, as you meet with him in your daily course, is the man of tact and experience, the man who is capable of dealing with the emergencies which arise without

hesitation, the man who impresses his employers with a notion that he is acquainted with the work which he attempts to perform. This practical man may sometimes be brought face to face, with more than usual difficulties; there may be an outbreak of some new disease, some startling circumstances that place him in an altogether unaccustomed position. Well, he deals with these circumstances, and he deals with them satisfactorily. He reasons from the causes to the effects, and he ascertains by the process of logical deduction how *this* is dependent upon *that*. But, gentlemen, recollect that, in so far as he does this, so soon as he steps out of the mere function of doing and commences the act of thinking, so soon does he become the philosopher, and ceases to be merely the practical man.

The confusion which has arisen is almost hopeless, but its existence is nevertheless quite undoubted. What you commonly call the man of great experience and the man of practice is after all the most scientific man. I could not in this presence tell you what the world means by a "practical" man because I should offend your sensibilities. The practical men, people would delineate for you, are not the "practical" men which you would desire to be. Nor, on the other hand, is the "scientific" man precisely the scientific man of your comprehension. He is not merely the student, the bookworm, the philosopher who is content to sit calmly by, searching for the knowledge which is to him nearly valueless, and disregarding the work which is given to him to do; this is not what you mean, it is not what I mean by the scientific man. What we really mean by the man of science is the man who has devoted his time to the acquisition of a profound knowledge of his profession, the man who is competent to reason out every subject definitely from cause to effect; the man who never meets with a difficulty without being able satisfactorily to overcome it, and the man who if he does not devote an exclusive attention to the mere manual work of his profession does not do so because he apprehends that the philosophic and scientific part of it is infinitely the more important of the two.

If I contend, gentlemen, this morning, for the necessity of a deep devotion to the study of science, I do not wish to be thought to underrate the importance of practical experience; but I desire to impress upon you this one important fact, that the practical skill will inevitably be acquired in the course of time. However awkward some of you may be from sheer want of opportunity to do, it is quite certain that in time to come you will acquire all the dexterity which you could desire. But

if you start with a conviction of the essential importance of the mere manual work, and if under the impression that the practice is the highest part of your profession and the science the lowest,—if under this idea you neglect the acquirement of the knowledge which you can obtain now or never (for mind, having once passed your period of pupilage, there is no longer a hope of your devoting enough attention to enable you to acquire the principles of science,) you may depend upon it, although time will give you the necessary skill, it will never give you the necessary knowledge. That must be acquired by exclusive devotion to it for the time being, and it is only during the period which you are required to remain at the college as pupils that you will have an opportunity of laying a good foundation, by acquiring the principles of science, and emphatically, by learning how to learn, for that is all you can possibly hope to do during the very short period which you are required to spend here.

This being the case, what is the work which you have placed before you? It comprises the sciences, as they are termed, of anatomy, physiology, chemistry, botany, materia medica, pathology, therapeutics, in addition to such practical duties of your profession as you must necessarily acquire even before you can commence practice. "A goodly list," you will say; rather discouraging probably to the newly entered student. But let me reassure you on this point. All the difficulties which present themselves to your notice at the outset, you will find vanish one after the other as you go quietly on your way, never concerning yourself about the ultimate result, but content to do the work that is set before you to-day and trusting to opportunities to enable you to do the larger amount of work which will come before you to-morrow.

The science of anatomy will attract your attention first. This, literally, is the work of cutting up, and if you imagine that you can acquire the knowledge of anatomy in any other way than by the use of your scalpel and forceps, abandon the idea at once—it is not to be done. Your readings on the subject are simply waste of time, at least in the beginning. The work must be done in the dissecting-room, and by the aid of your knives you must trace out the tissues, the structures of the animal body, if you have any desire to acquire a practical acquaintance with them. No intellectual qualifications are necessary for this mere mechanical work of tracing out what obviously lies before you. In this department of your studies you will have the advantage of the lectures of Professor Pritchard, and you will have the assist-

ance in the dissecting-room of Assistant Professor Axe. You will with these aids, I doubt not, in the course of a very short period become familiar with all parts of the animal body, so far as you can observe them by your unaided eyesight.

But having learned something of the names and positions of bones, and muscles, and arteries, and nerves, and of the situation of various organs of the body, you will naturally feel inclined to inquire of what these things are made. You look at a piece of muscle and it presents itself to your eye as a mass of red substance. You will desire to know what this red substance is composed of. Then you go on to separate it into its elements, and by and by you find that your eyes are no longer of use to you, and you take your pocket lens and you find what you can get with this aid. By and by this becomes of no use to you, still there is something more to be done. Then you take what I was going to say, unfortunately, is called a microscope, because the microscope which you will use in the brass stand is not more a microscope than the lens which you carry in your pocket; but the impression has gone abroad that it is something very remarkable in arrangement, something which requires an almost exclusive attention to enable the observer to use it efficiently, something the study of which takes up more time than the matter is really worth, and thus considerable opposition has arisen to its employment.

If you will simply bear in mind that the microscope is supplying the place of your eyes, which are not sufficiently active for the purpose, you will understand that when you want to find out the ultimate elements of structure this instrument furnishes you with the only method of doing it. It is simply monstrous that there should be any question about the fact of every man who is concerned with the treatment of animal disease being able to use this instrument with perfect facility and readiness, and calling it to his aid on every occasion when the least doubt arises.

Having carried on minute investigation to a certain point, probably questions will arise in your mind as to the uses of these various parts, and thus is introduced to you the subject of physiology, which may be looked upon as the sum of the actions which are going on in the organized body, and the manner in which those actions are performed. This interesting science will take you through the minutiæ of the actions which are going on in animals and vegetables, and will enable you to understand something of the processes which are entirely hidden from those who are

unacquainted with more than the mere anatomy of the animal or vegetable kingdom.

Your next inquiry will be as to the chemical composition of these various structures, and you call in chemistry to your aid. In this department I need not recall to your memory that Professor Tuson will be ready to give you assistance. It will be his duty and pleasure, I doubt not, to point out to you first of all the simple elements and then to trace them through their complex arrangements. You will probably inquire as you go on what oxygen and hydrogen and other chemical bodies have to do with veterinary science. If you do make the inquiry let me advise you to suppress it till you have passed through a sessional course at least. It is one altogether unworthy of you, and it is one which really does not deserve an answer. The question *cui bono?* indicates an unsatisfactory condition of mind. You may depend upon it that these studies are not arranged for the purpose of inflicting on you considerable annoyance; it is only under a distinct sense of their absolute necessity that they have been introduced gradually under pressure from without into the curriculum of this and other institutions. There was a time when you might have sat upon these benches and have gone through the college course without being troubled in the least about the chemical constitutions of bodies or the botanical relations of various herbs to the condition of the animal body. But those times are happily past. It is more satisfactory to know that progressing knowledge from without, the advancing education of the people, has absolutely forced us step by step to make the collegiate course what it at present is.

From the subject of chemistry you will pass to materia medica, which will teach you the nature of the medicines which you employ, their sources, modes of action, and doses.

Then you will be introduced to the grand science of pathology; and if I refer to the name of the principal of this institution, after I have spoken of the professors, you will understand that I do it for the reason that I connect him with the subject which follows in natural order after anatomy, physiology, and chemistry. It is essential that you know something of the constitution of the animal body before you can properly realise the changes which occur as the result of disease.

It is not necessary for me to tell you that Professor Simonds combines the requisites which the most exacting can demand, the qualifications of the scientific and the practical man. No one can question the extent of his

practice long before he entered the walls of this institution, and no one who knows the work that he has done can possibly doubt his possession of the necessary scientific attainments. You will therefore, gentlemen, have the science of pathology presented to you, not as formerly in a disjointed shape, as though there were one pathology of the horse and another of the ox, but the science in a connected form. You will be told something of the elements of which disease consists, and you will be led step by step to those complex forms which you will meet with in the course of your practice.

Then, as incidental subjects which have recently been added, your attention will be called to botany and therapeutics. Some of you, I am glad to say a considerable number of you, have already had the advantage of a summer course of botanical lectures; and all of you, I doubt not, will have the satisfaction of sitting before Dr. Cobbold during this session, and acquiring the knowledge which he is so capable of affording you in the important subject of parasitic diseases of stock. But to return to the subject of botany. It is a source of great satisfaction to everybody, it is a source of congratulation to the governors of this institution, that the subject has been introduced here, and has been placed in such very efficient hands.

Those of you who had the advantage of attending the field excursions, I am quite convinced, will not need that I should say anything to recommend this subject to your intimate attention; but perhaps you will permit me to say, that it is simply impossible to overrate the importance of a knowledge of botany, in ordinary country practice.

It is a strange circumstance that botany, of all divisions of the curriculum, has been the least popular. Years back I can recollect the mere mention of it at this table excited an expression of anything but satisfaction on the faces of those who were listening to the lecturer's words; but I am equally proud to know that the first experiment, the mere giving of a course of lectures of two months' duration with practical instruction has been quite sufficient to convince the students that it is not only an interesting but an exceedingly valuable addition to their studies.

The subject of therapeutics will also form a part of your summer course, and it will be my endeavour in speaking on that subject to point out to you as I did during the last course, the fallacy which is expressed in the statement, that medicine has no principles. I think that we were quite in a position to decide at the end of that course that it is possible to prescribe for a definite reason, and that it is not at all

times necessary to give medicines merely for the sake of ascertaining what effect they will produce,—that there is a connection between disease and the remedy which cannot be mistaken by the man who is thoroughly indoctrinated with the principles of the science of therapeutics.

Then, gentlemen, there is another subject which has lately been introduced here, that of practical instruction, a most important one to this extent, that it will enable you to acquire a certain amount of tact and dexterity in the performance of those simple duties which you will be called upon to at once carry out the moment you commence your practice. You will be taught in this division of your studies how to approach an animal without convincing the owner of it that you never did anything of the kind before; and, having acquired such an amount of knowledge as will enable you to proceed consistently and as men accustomed to the work, you may very safely trust to your advancing experience to make you equal to every emergency. Only be quite sure that you obtain the necessary scientific knowledge; and with the addition of such an amount of practical tact and skill as you may acquire here if you choose to take the trouble, you need have no fear of the ultimate result.

Now as to the course which you will find it necessary to pursue in order to acquire the necessary knowledge of your subject. The first thing that you are asked to do is to attend upon the course of lectures. The word is to attend; you are required to do that, and that is all the laws of the college can compel you to do. But will you permit me a moment to tell you what that means? The word comes from the root "tendo," which means to stretch or strain; and if you recollect, we have certain words connected with it; there is such a thing as "tension" and "attentive;" and, lastly, "attendance." Let me first of all tell you what attendance at lectures does not mean. It does not mean sketching facetious caricatures in your note-books. They may be excessively ingenious, and in some other walks of art might raise you to the highest pinnacle probably of artistic glory, but they are simply out of place here. It does not mean resting your heads comfortably upon your hands and simulating at least the appearance of sleepiness.

Attendance, on the other hand, does mean a strain of the attention to catch every word which the lecturer utters; it means emphatically a strong mental effort. If I were talking to you now in some language which you scarcely understood, and upon a subject on which your lives depended, just imagine how your ears would be opened to every syllable, and

how very anxiously you would endeavour to analyse the precise meaning of every word which I said; how you would rush to your dictionaries directly it was all over and seek out those expressions which you had failed to interpret! And this would be simply attendance; this would be giving that attention to the subject of the lecture which it is absolutely indispensable you should give if you intend to obtain any advantage from it.

Well, this being done, the next question for you is, What are you to do after you have attended? Then comes the subject of reading, and in speaking of this I wish to guard you against making a very gross blunder which I am afraid is very often made. There is an apprehension that reading means going through the words of a book; and if you take a volume and sit down and go through it in the course of an evening or two, you fancy that you have read it. I assure you that you have done nothing of the sort.

Do you know what is meant by the term "literary"? Do you know that it means something in relation to letters, and that a literary man is a man who really understands the construction of every word which comes before him, just as you pathologists or anatomists will understand the structure of every tissue of the animal body; that it is a question of letters and not simply of words; that it is necessary to know what this word precisely means now and what it really did mean formerly, what the author meant in using it, and whether you have rightly apprehended his meaning in the interpretation which you put upon it.

It was the remark of some one that before we read at all we should think ourselves hungry and then read ourselves full. Do you know, for example, that if you are inquiring closely upon any one subject, suppose you want to know something of the constitution of a particular material, you do not take one book on the subject and read it straight through, but you go to your library and take out a number of volumes, some of which say little and some a great deal about this matter, and you examine them; and having satisfied yourself that you have learned all that you can of what other people think of the subject, then you may safely set to work to think about it yourself. This is absolutely reading. If you want to know something of the functions of a particular part of the animal body, while you have that want simply fixed in your mind get all the books which are accessible to give you any knowledge on that particular subject; you may depend upon it carrying on your studies in this way will enable you to grasp them one by one and in such a manner that

they will never escape from your memories as long as you live.

Then you will be required, besides attending lectures and reading for the purpose of actually acquiring knowledge, and not merely for the sake of saying that you have read—you will be required to devote a considerable portion of your time to the dissecting room and laboratory. The dissections which you will be required to carry on, I have already told you, will include every part of the animal body. Step by step you proceed, till you have rendered yourself familiar with every portion, and have so rendered yourself familiar that there will be no chance of its ever being an effort of memory to recall what you have learnt.

It is rather remarkable to hear a veterinary surgeon say that he acquired a great deal at his college which he has now forgotten, simply because he found it of no use to him. I assure you that the only regret I ever experience myself is that I have forgotten a good many things which I am constantly finding would be of a great deal of use to me, and it takes a considerable portion of my time to look back and get as much of my previous knowledge for present use as I possibly can. The idea of the knowledge of anatomy and physiology ever being useless to a man who attempts to treat the animal body in a diseased condition, when he knows full well that not the smallest injury can occur but it must implicate some important structure! How is it possible that he can give a deliberate opinion as to the probable consequences of that injury unless he knows exactly the origin, course, attachments, and function, and the minute structure of the tissue so injured? Anatomy and physiology are subjects which you can never afford to let slip out of your grasp. I may say the same thing of all the other subjects, but especially in reference to these; a correct knowledge of the elements of the machine must be acquired before you can rationally attempt to put it in repair when it is out of order.

The time which you will spend in the dissecting-room, then, will be well employed. You must give very close attention to this part of your studies if you ever hope to become clever practitioners. Your work in the laboratory, I assure you, will be equally productive of results. There is nothing more unfortunate than to be unable to make a simple examination of the fluids or solids of the animal body, to ascertain the reactions of their secretions; and can you conceive any act more completely absurd than the prescription of an acid or an alkali without knowing whether the

state of the secretions at the time you exhibit those agents renders either one or the other necessary?

If I suggest to you that as members of a liberal profession you are bound to avail yourselves of all modern appliances for carrying on investigations, I presume I shall be doing no more than commends itself at once to your sympathies.

That the veterinary surgeon of the day should neglect the use of the thermometer, which every surgeon carries in his pocket; that he should be incapable of using the microscope, which you find in the study of every medical man, is a simple reflection upon the intelligence of the whole profession. It is an error which it is high time should be repaired, and until it is repaired you may rest assured the public will have no reliance at all upon our conclusions when any difficult subject of investigation is brought under our notice. It occurs to me perpetually in my journeyings through the country that people complain, not that veterinarians are unpractical—I never hear that—as far as my own observation extends, there are no more practical veterinary surgeons in Europe than there are in our own country. I am compelled to say that there are more scientific veterinarians on the Continent, and it is my hope, it is the hope of every one connected with this and other institutions of the like kind, that we may be enabled to give our students a foundation of true science, and leave them then safely, as we shall be enabled to leave them, to work their way straight through the world.

In the steady pursuit of knowledge, then, you may usefully occupy every hour of the day, and so much of the night as you can well spare from the needful time of repose. As to your periods of relaxation, I say nothing, more, at least than is necessary to warn you that all the popular amusements of the day are hopelessly enervating in their effects upon the intellect. Even the very mild dissipation of reading novels is distinctly opposed to anything like serious study. The time which you have here is short enough in all conscience, and if you devote every moment of it to the acquirement of science, you may depend upon it you will never afterwards regret that you did not give up a certain space of it to your amusements. There is enough work, you may depend upon it, to be done—I do not mean for the mere purpose of obtaining your diplomas, because I look upon that achievement as a very insignificant result of your studies here; it is something that is necessary for you, and something which you will easily obtain if you merely take the trouble to work for it. But I wish to

see you work for something altogether beyond and above this if you have any hope of succeeding, making a mark for yourselves in the course of your practice.

If you are rightly occupied, you may depend upon it that your recreation will grow very easily out of your work; and have you not after all a grand subject for contemplation? Not only in all that relates to your own profession, not only in the interest which you will experience in tracing out the minute elements of the animal body in ransacking as it were the material world, and finding all that you desire, not only in the satisfaction which you will experience in counteracting outbreaks of disease and relieving suffering animals; but have you not the whole universe spread out for your observation, the earth with its trees, and forests, and fields, rich with fruitful grain? Have you not the clear streams, "with every wave crested with healing as though they ran troubled of angels"? Have you not the mountains sending their summits into the azure beyond? and have you not, above all, that "untroubled and sacred sky opening straight through its veils of mist and curtains of dew into the awfulness of the eternal world, where every cloud that passes is literally the chariot of an angel, and every ray of morning light streams from the throne of God"?

If you will be content to seek your recreation in the study of the works of the natural world, you will find that you have a never-failing source of keenest delight. But in doing this, let me warn you not to fall into the black abyss of materialism.

Your scientific studies will naturally compel you to concentrate your attention mainly upon matter, but you are not therefore bound to become mentally blind to the existence of a spirit world. It is strange that the grand achievements of modern science should have for their object the association of human nature with the brute, that one of the highest triumphs of the greatest investigator of modern times should be to connect man with an arboreal monkey. Do you want to know what the evolution theory amounts to? Let me read to you the words of Professor Dawson, not unmixed with irony, as he describes it here. He says:—

"It introduces us first to an ape, akin perhaps to the modern orang or gorilla, but unknown to us as yet by any actual remains. This creature after living for an indefinite time in the rich forests of the Miocene and earlier Pliocene periods, was at length subjected to the gradually increasing rigors of the Glacial age. Its vegetable food and its leafy shelter

failed it, and it learned to nestle among such litter as it could collect in dens and caves, and to seize and devour such weaker animals as it could overtake and master. At the same time its lower extremities, no longer used for climbing trees, but for walking on the ground, gained in strength and size; its arms diminished; and its development to maturity being delayed by the intensity of the struggle for existence, its brain enlarged, it became more cunning and sagacious, and even learned to use weapons of wood or stone to destroy its victims. So it gradually grew into a fierce and terrible creature, 'neither beast nor human,' combining the habits of a bear and the agility of a monkey with some glimmerings of the cunning and resources of a savage.

"When the Glacial period passed away, our nameless simian man, or manlike ape, might naturally be supposed to revert to its original condition, and to establish itself as of old in the new forests of the modern period. For some unknown reason, however, perhaps because it had gone too far in the path of improvement to be able to turn back, this reversion did not take place. On the contrary, the ameliorated circumstances and wider range of the new continents enabled it still further to improve. Ease and abundance perfected what struggle and privation had begun; it added to the rude arts of the Glacial time; it parted with the shaggy hair now unnecessary; its features became softer; and it returned in part to vegetable food. Language sprang up from the attempt to articulate natural sounds. Fire-making was invented and new arts arose.

"At length the spiritual nature, potentially present in the creature, was awakened by some access of fear, or some grand and terrible physical phenomenon; the idea of a higher intelligence was struck out, and the descendant of apes became a superstitious and idolatrous savage.

"How much trouble and discussion would have been saved had he been aware of his humble origin, and never entertained the vain imagination that he was a child of God, rather than a mere product of physical evolution. It is, indeed, curious, that at this point evolutionism, like theism, has its 'fall of man;' for surely the awakening of the religious sense and of the knowledge of good and evil must on that theory be so designated, since it subverted in the case of man the previous regular operations of natural selection, and introduced all that debasing superstition, priestly domination, and religious controversy which have been among the chief curses of our race, and which are doubly accursed if, as the evolutionist believes, they are not the ruins of something

nobler and holier, but the mere gratuitous, vain, and useless imaginings of a creature who should have been content to eat and drink and die without hope or fear, like the brutes from which he sprang."

There is another account of the origin of man written in an older Book and expressed in fewer words. It runs thus:—"And God created man in his own image. He breathed into his nostrils the breath of life and man became a living soul." If *this* account is unsupported by scientific basis, is *that* one capable of accurate demonstration? and if they are both myths shall we not accept the one which connects man with his Creator, rather than the one which drags him down to the level of the brute? Hold fast to a conviction that you have a nature which possesses infinite capacity. Believe with the poet that—

"Dust thou art, to dust returnest,
Was not spoken of the soul."

Cling to the faith which teaches that humanity may claim kinship with divinity, and then, whatever your career may be, whether you reach the highest pinnacle of fame or scarce attain the level of mediocrity; in the brightest sun of prosperity, and in adversity's darkest night, be content so you can stand erect and boast in the words of Emerson, "Am I not also a man?"

Professor Simonds: Gentlemen, we are honoured on this occasion, and I think I may say perhaps for the first time in the history of the opening of the session, by the presence of one of the Vice-Presidents of the College who has taken this chair. I have the greatest possible pleasure in introducing to you Sir James Tyler as representing the Governors of the Institution, and identifying them with the educational department of the college. It is a new feature somewhat, and we ought therefore to be exceedingly obliged to Sir James for honouring us on the occasion. Sir James Tyler will now present the medals and certificates which have been awarded to the successful competitors for the Coleman Prize, and also for the office of Monitor, viz.:

COLEMAN PRIZE.

Mr. Peter Avis, Ramsgate . . .	Silver Medal.
,, Charles Walter Emms, Ilminster .	Bronze ,,
,, Henry James, Burwash . . .	Cert. of Merit.

MONITORS, 1871-2.

Mr. Iles Matthews .	Woolwich.
,, W. H. Hinde . .	Brockdish, Norfolk.
,, T. Briggs . .	Prestwich, Manchester.

Mr. C. Middlehurst	Liverpool.
„ M. P. Greene	Corbally, Co. Clare.
„ H. Collett	Carter's Green, West Bromwich.
„ H. J. Hancock	Uxbridge.
„ O. S. Hills	Leamington.
„ P. Avis	Ramsgate.

After the presentation *Sir James Tyler* said, On entering the college this morning I had no idea that I should be called upon to appear before "the board of green cloth." I have not only had great pleasure in being here to-day, but have been well rewarded for any little inconvenience which I may have been put to by the very interesting and instructive lecture which we have all just heard. That lecture is so full of what is required, that I feel as if I were quite unable to add any remarks to it. You, the students, may not be all gifted alike in learning quickly, but I must say, from the number of subjects that have been spoken of as forming the curriculum of your studies, and the ability of the lecturers whom you will have the privilege of listening to, the college ought to turn out a great number of first-class men. It has occurred to me that while you are pupils here you ought only to have one thought, and that is the Veterinary College and its objects. From the time you get up in the morning till you go to bed there is business before you and work to do. You ought ever to remember that it is very annoying to your teachers, after the very great care and thought they have given to their respective subjects for your instruction, to find that you do not pay attention to them. None of us would like it. The idler is very much like a watch without hands, as useless when he goes, as when he stands still. My friends right and left of me can have no greater reward than to find that you are attentive to their lectures. No pains will be spared on their part, and as men get older they value what they do and think more of it, because they have had to work hard at it. You must please to receive their admonitions in all kindness; and if they should be a little sharp with you sometimes, take it as from your best friends. I will not detain you longer, but conclude by expressing a hope that you will carry away with you the very interesting and valuable remarks which have fallen from our learned Professor.

A NEW FORM OF MICROSCOPE FOR THE POCKET.

By G. T. Brown.

A pocket microscope, capable of doing really good work, has long been wanted. The large and elaborately furnished instruments of the day answer perfectly in the study or the laboratory, although it is an open question if a great part of their mechanism might not be well dispensed with; but for use on emergencies which are perpetually arising at all sorts of inconvenient times, when access to the large microscope is out of question, a smaller instrument, which can be carried in the pocket as easily as a thermometer, will afford valuable assistance to the physiologist and pathologist, and often enable him to complete an investigation which would otherwise be postponed, or probably altogether neglected.

Not only is it convenient, but often indispensable, to be able to carry on a minute examination in the sick chamber, or in the field or cowshed. Morbid products undergo change very rapidly, and unless an observation can be made immediately the inquirer is often left in doubt as to some essential particular, and hesitates to decide whether certain remarkable appearances are due to changes which have occurred in the living animal, or are the result of commencing putrefactive fermentation.

The detection of microzymes in the blood of animals affected with splenic apoplexy and other blood diseases may be referred to by way of example.

Pathologists are aware that the presence of Bacteria and Vibriones in the blood of living animals is an indication of a condition of that fluid, absolutely incompatible with maintenance of the vital functions. The discovery is therefore of essential importance, and it is seriously incumbent on the inquirer to determine whether the microzymes really exist in the blood of the living animal or were developed in that fluid after its removal from the body.

Bacteria are common to organic fluids which have undergone decomposition, and a few hours will suffice to account for their presence in fluids which presented no trace of them on the first examination. Hence the importance of micro-

scopic investigation being conducted with as little delay as may be.

Objectives of high magnifying power are indispensable in the examination of morbid products; the problem, therefore, to be solved was the construction of an instrument of small size and simple mechanism, capable of magnifying at least six hundred diameters. The solution of the problem is furnished by the little instrument which is depicted in the illustration. The microscope was made, under my direction, by Mr. Swift, optician, of University Street, and answers the intention in a most admirable manner. I did not doubt that I should obtain a very useful instrument, but I did not anticipate results so entirely satisfactory as those which have been obtained. The movements, both coarse and fine, are perfect; the definition of the objectives, the inch, fifth, eighth, and twelfth, is exceedingly good; and the workmanship is excellent. The principle of the short body, with deep eyepiece, has been worked out completely, and after a trial of several weeks, in various places and under all sorts of disadvantages, it is satisfactory to be enabled to say that in practice the microscope leaves nothing to be desired.

A short body naturally involves a loss of amplification, which must be compensated by a deep eyepiece; for instance, the present instrument of three inches in length, with an E eyepiece, may be estimated to magnify, with the same objectives, about the same number of times as a microscope with a ten-inch body would with an A eyepiece, while the deep eyepiece has the further advantantage of acting as a very sensitive fine adjustment, by merely altering the position of the draw tube, in which it is inserted.

The small instrument which I have used in the fields, shed, or room, in a railway carriage, and on the top of an omnibus, is provided with an inch, a fifth, and an eighth objective, the latter with an immerson lens, giving the magnifying power of a twelfth. It has also three eyepieces commencing with C, but the one which is most effective to general use is E.

A polarizing apparatus and other appliances can be added if required. When closed the microscope, as shown in Fig. 1, is a trifle over three inches in length, and one inch in diameter in the largest part. The box which carries the objective and eyepiece slides smoothly in a tube (A, Fig. 2), on which a box (B, Fig. 2), containing a spiral spring and an accurate fitting plug, forming the stage, is screwed. The mirror is held by a pin which passes through a hole in the lower part of the stage, so that it can be arranged at any distance

from the object, or be turned away altogether when it is desired to use the instrument with direct light, after the manner of a telescope.

A case to contain the microscope, with two slides and a piece of thin glass, occupies a very small space, being three inches and a quarter in length, one inch wide, one inch and an eighth in depth. A case of double the width will hold, besides the microscope and slides, an extra eyepiece and two objectives in boxes, one objective being always kept ready for use in the body of the microscope, a small glass tube or rod, and two dissecting needles. This case is considerably less cumbersome than the smallest pocket case of surgical instruments.

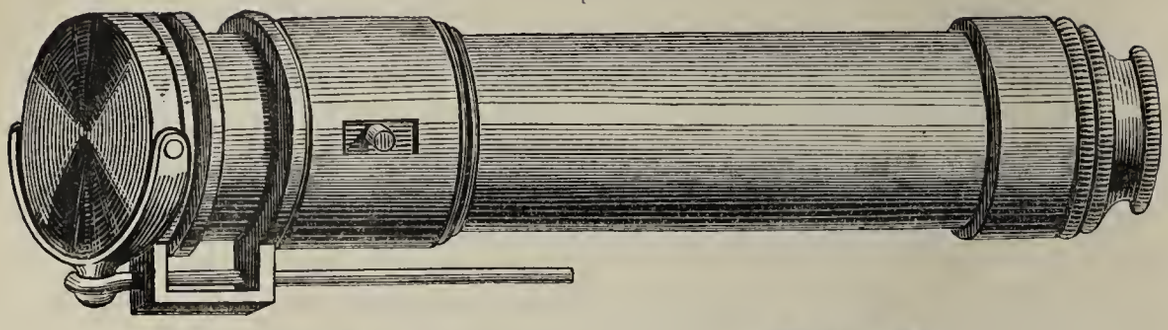
In using the microscope the first step is to prepare the object in the usual way by placing it on the slide, adding a drop of water if necessary, and covering it with a piece of thin glass. The instrument is then to be taken in the left hand, the pins which project from the stage box are to be pulled back and the slide inserted into the space between the ring on the plug and the bottom of the microscope (as at C) ; the spring presses sufficiently to hold the slide firmly and allows of its being moved freely with the fingers. The mirror (G, Fig. 2), having been pulled out sufficiently, is inclined towards the light, the draw tube (E) is pulled out about half its length, the body of the instrument (D) is then to be slowly moved downwards in the outer tube until the object is fairly in focus. The fine adjustment is obtained by moving the draw tube (E). When the immersion lens is employed the microscope may be conveniently turned up so that the bottom of the stage is towards the eye, and the body of the instrument may then be pushed upwards until the drop of water is seen to come in contact with the covering glass over the object. At this point the object will usually be sufficiently focussed to render the subsequent adjustment quite easy.

For field work the small apparatus depicted in the plate at Fig. 3 will be found useful. The point may be pushed into the top of a gate-post or rail, and the microscope may then be clamped in the ring at the top, but generally it is more convenient to hold the instrument in the hand.

The twelfth of an inch objective is the highest which has been tested, but from the ease with which this is worked there is no doubt that a twenty-fifth might be used with satisfactory results.

Another form of portable microscope improved by Mr. Swift is shown in the next woodcut (Fig. 4).

FIG. 1.



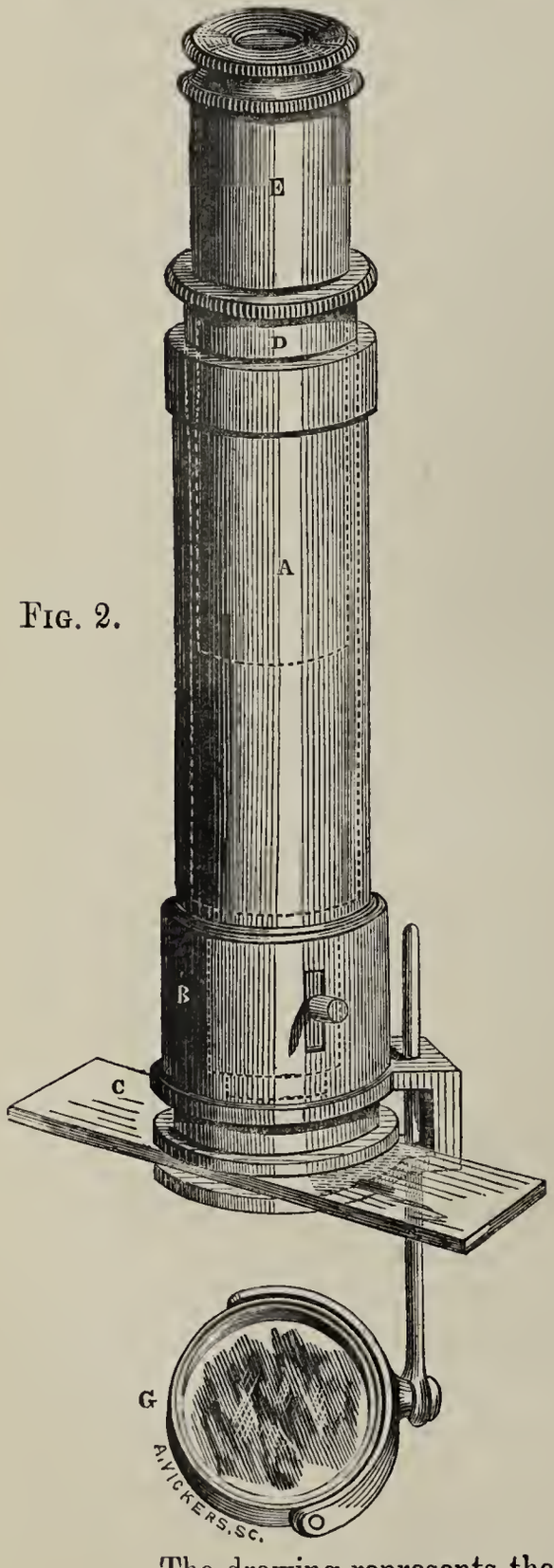


FIG. 2.

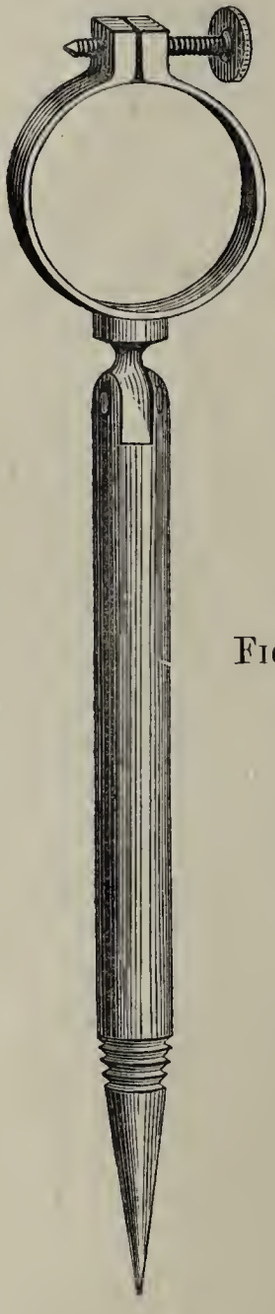


FIG. 3.

The drawing represents the actual size of the microscope.

This microscope is supplied with an adjustable stage of sufficient size to carry the ordinary 3 by 1-in. object slide, and

Fig. 4.

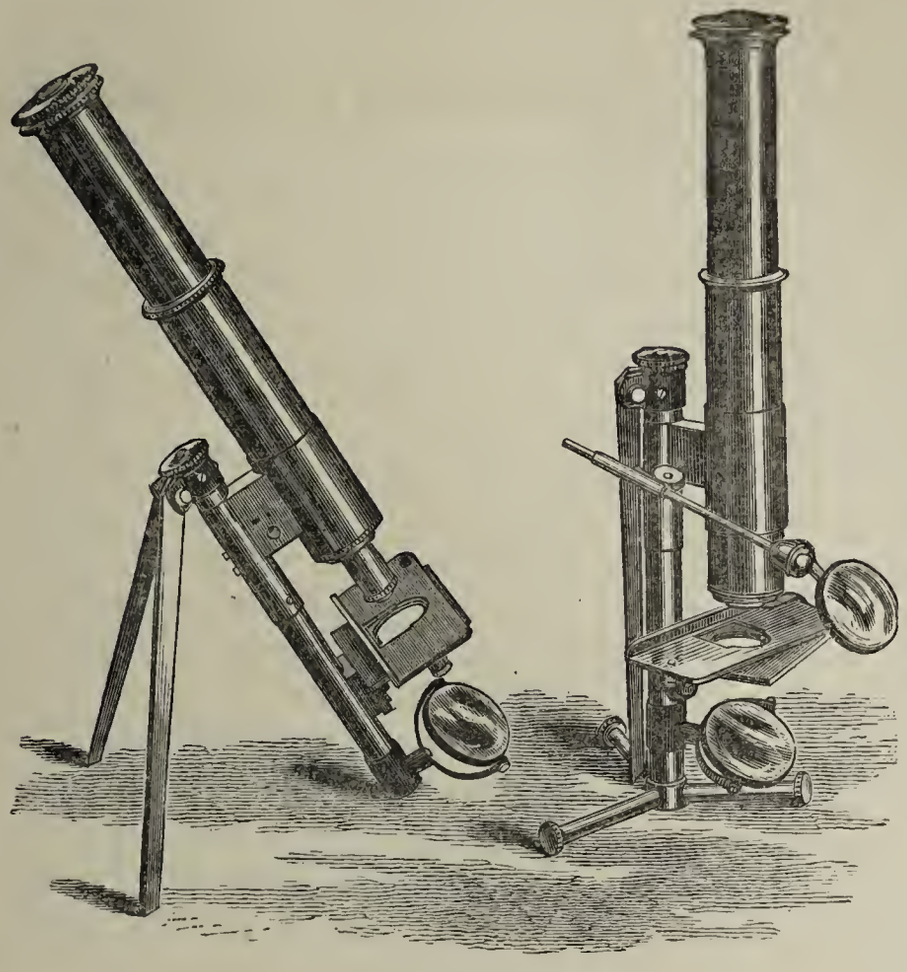
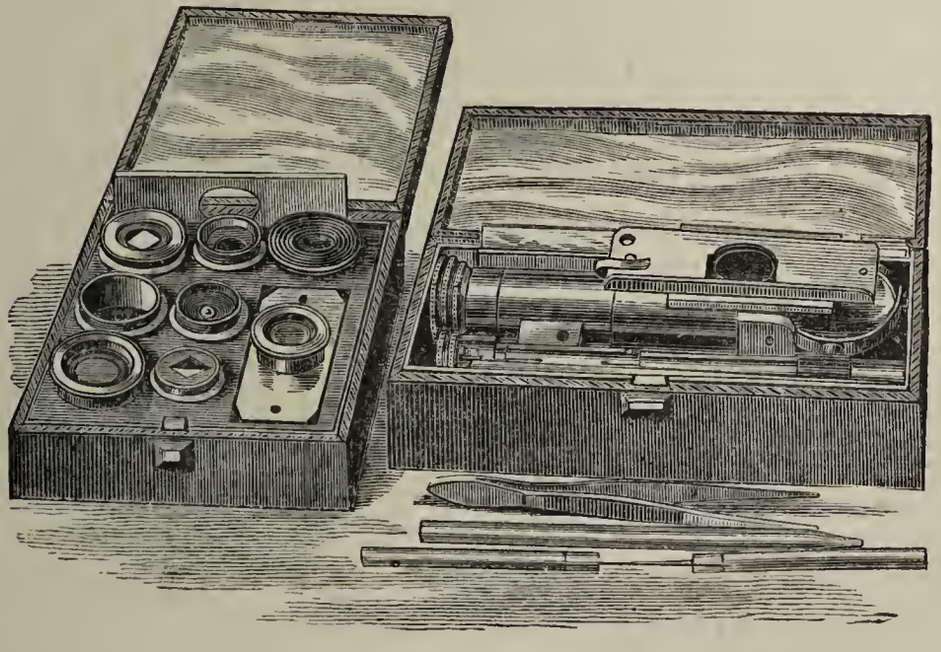


Fig. 5.



the stage is also so constructed that the object under examination can be moved about freely, and easily adjusted under the magnifying power of 600 diameters. This stage, being large, is made to turn on an axis for the purpose of packing

in the portable way, as shown in illustration. The microscope is furnished with a first-class slow adjustment, which will focus, without lateral motion, under a $\frac{1}{8}$-in. objective; the eyepiece is made to slide in the draw tube, so that an extra power eyepiece can be adapted if required; the joints of the two legs of the microscope, which form part of the tripod upon which the instrument stands, when in use, are made so that that they can be tightened to compensate for wear and tear.

When packed in its case the microscope does not occupy much room, but a case of seven inches in length by three in breadth and three in depth is too large to be habitually carried in the pocket; the instrument, however, is very easily carried, and it is so arranged as to be quickly put in order for work.

A second case, shown in Fig. 5, contains polarizing prisms and other apparatus, which the student will require as he advances in his study of microscopy. But for some time he will find enough of really useful work which he can do with a plain instrument of simple construction, with two good objectives of an inch, and a quarter-inch focal adjustment. When he has done all that is capable of being done with these aids, he may begin to consider the propriety of indulging in mechanical refinements, which are very numerous, exceedingly ingenious, and terribly expensive, and, finally, not often adapted to the requirements of the practical observer, who desires, above all things, simplicity in his instruments.

THE ETIQUETTE OF VETERINARY AUTHORSHIP.

By G. Fleming, M.R.C.V.S., Royal Engineers.

From several independent sources, my attention has been called at various times lately to the chapter on *Shoeing*, in Professor Williams' recently published work on 'The Principles and Practice of Veterinary Surgery,' and to the apparent and what is designated "the very obvious unfairness" with which the ideas of others are appropriated without acknowledgment, or are knowingly ascribed to persons to whom they do not really belong.

It would appear that, in his remarks on Shoeing, Mr. Williams repeats substantially, if not almost literally in some parts, a portion of what has been written by me on this

subject in my work on "Horse-Shoes and Horse-Shoeing," published more than three years ago; and again in my essay on "Practical Horse-Shoeing," to which the first prize was awarded by the Scottish Society for the Prevention of Cruelty to Animals, and which was published at the commencement of the present year.

It would also appear that, in the course of his remarks, Professor Williams does not offer the slightest indication of the source from which he derived his ideas; neither does it seem that there is anything offered on this subject beyond what is to be found in the two above-mentioned works; it is only at the conclusion of the chapter that he acknowledges having borrowed materials for its construction from an unpublished essay by Mr. Broad, of Bath, and which obtained the second prize from the Society on the same occasion as that on which I had the honour to receive the first.

How far this statement may be correct there are at present no means of judging, as neither I nor my correspondents have seen Mr. Broad's essay; but this I do know, from an indisputable authority, that that gentleman did refer to "Horse-Shoes and Horse-Shoeing" in the composition of his treatise, and, as might have been expected, duly and honorably acknowledged that he had done so.

In the second place, my attention is also drawn to what would appear to be a fact—that the horse-shoe which Mr. Williams figures and recommends for use—but without mentioning any names, and the introduction of which might therefore be ascribed to himself—is in principle, if not exactly the same as that which Staff Veterinary Surgeon Thacker proposed, and which has been in use for several years. It is described and figured by me as Mr. Thacker's horse-shoe in the essay on "Practical Horse-Shoeing."

If the facts are as my correspondents state, it is evident that I have some reason to complain; not because mention of my name has been omitted from Mr. Williams' work in reference to this subject—for I can well afford to overlook that exclusion; but because that which was written by me has been ascribed to another who, so far as I am aware, has published but few opinions on the subject, and some of these did not, at one time, quite harmonise with those attributed to him by Mr. Williams.

In a first attempt at authorship, mistakes will occur beyond those attributable to the printer, and be due either to want of experience or ignorance. In this instance, whatever reasons may be adduced, certainly ignorance cannot be offered as an excuse. I have reason to believe that "Horse-Shoes and

Horse-Shoeing" was known to Mr. Williams soon after its publication; and he was one of the authorities appointed to examine the shoeing essays, with a view to the awarding of the prizes. He must, therefore, have known the contents of these essays, and in all likelihood something of the work published three years ago. With regard to Mr. Thacker's horse-shoe, Mr. Williams states that the shoe he recommends has been in use in Edinburgh for about two years; that would be about, if not subsequent to, the period when my essay was in the hands of the judges.

In literary circles beyond our own, such ungenerous conduct would be very sharply criticised and properly designated; and I can see no reason why veterinary writers should not be bound to conform to the same canons of behaviour which govern other writers.

In this instance, however, I could well afford to treat the matter with perfect silence and indifference, did I not think it a bad precedent to establish. In this country we are a profession almost without a literature, and it behoves those who venture on the somewhat ungrateful and laborious task of repairing this misfortune to be careful in the example they may afford. Private feeling should never be permitted to interfere with the principle and public duty of acknowledgment and justice.

I heartily congratulate Mr. Williams on his *débût* in veterinary literature, and wish him every success. He will, perhaps, find that literary work, no matter how conscientiously it may be performed, nor how laudable may be its object, has its pains and penalties, as well as its pleasures, toils, and responsibilities. One thing I can sincerely promise him—that if ever I have occasion to quote from anything he has written, I shall deem it my privilege and duty, as it will be no less a gratification, to render unto Cæsar that which is Cæsar's. Such has been my line of conduct hitherto, and in this I have only followed those who were desirous of acting honorably and fairly towards their colleagues. This is not a private matter, but one which closely concerns our professional reputation.

OBSERVATIONS ON CASES OF LEUCORRHŒA.

By A. E. Macgillivray, V.S., Banff.

The generative organs and their diseases in the lower animals seem to attract comparatively little if any attention from the veterinary profession. In no English veterinary work that I have seen has this subject received anything like a thorough investigation. This is the more astonishing when we consider what an amount of time and erudition has been expended by the medical profession in discussing the same subject as regards their patients.

Leucorrhœa, for instance, how cursory is the notice taken of it by most veterinary writers; a couple of dozen lines and the matter is dismissed, so that when the newly fledged practitioner meets a rather severe case he is completely taken aback.

The designation of the disease itself, namely, leucorrhœa, is somewhat anomalous, as is also the vulgar appellation of *the whites*. It cannot be denied that the discharge, in cases of this disease, is often white, but it can, at the same time, be most undoubtedly asserted that it is far from invariably being so. In fact, the discharge or *flow*, in so far as my experience goes, may be clear, white, yellow, greenish, or even slightly reddish-brown in appearance; and I believe such is the expressed opinion of most medical writers on the subject.

In offering a few observations on this affection, I do not mean to give the details *seriatim* of a number of cases, but simply to record the ideas I entertain from actual experience in treating such cases.

Leucorrhœa, then, as a disease in the lower animals, may occur in three distinct forms; namely, (1) as affecting the vagina, (2) as affecting the cervix uteri and vagina, and (3) as affecting the uterus itself. In other words, it may be vaginal, cervico-vaginal, or uterine.

It may be as well, also, to premise here that the discharge may assume any of the three following characters, namely, mucous or nearly so, muco-purulent, and purely purulent.

In the first-mentioned phase of the disease, which I have called the vaginal, the causative irritation is confined to the vagina, and the coincident discharge is generally clear, mucous, acid in its nature, and *continuous* in its flow.

The abnormal secretion from the vaginal mucous glands is sometimes large, and the lining membrane of the passage, in such cases, becomes much discoloured and irritable; at times the superincumbent epithelia are detached and thrown off with the discharge, where they are easily discovered.

It is very necessary not to confound this form of leucorrhœa with "*bull-burnt*," or, as some writers style it, *gonorrhœa*. In the latter disease, however, we have a most characteristic eruption of minute pustules, which ought, on inspection, at once to settle the matter.

The second form of the disease, namely, that affecting both the cervix uteri and vagina, is most common. It is accompanied with, or, more properly speaking, it consists of a more or less continuous and pretty profuse white curdy or yellow creamy looking discharge. The cause of this white, curdy, or yellow creamy appearance of the discharge is not altogether satisfactorily to be accounted for. The yellow creamy discharge will generally be found to be composed more or less of pus, while the white curdy discharge may owe its origin partly to the action of the acid secretion of the vaginal walls on the profuse and mostly alkaline production of the cervical glands. The character of the discharge will, however, depend much on the *cause* of the disorder.

I am inclined to think that this form of leucorrhœa almost always originates in the cervix uteri, and that it is communicated to the vagina by the continual irritation of the discharge through the passage, so that in due time it becomes truly cervico-vaginal. The discharge in this cervico-vaginal leucorrhœa may, however, be either continuous or merely occasional.

When continuous it will be found that the os uteri is in a relaxed state, thus allowing the steady escape of the leucorrhœal productions of the cervix. On the other hand, if the discharge in cervico-vaginal leucorrhœa takes place only occasionally, it will be found that either the os uteri or the external part of the vaginal passage immediately behind the meatus urinarius (*i. e.* the ostium vaginæ) becomes at times contracted and closed up, and thus for a time causes the retention of the diseased productions, *i. e.* the leucorrhœal discharge of either of these parts. The occasional relaxing of these contractions will at once produce a leucorrhœal "flow."

Uterine leucorrhœa, the third form of this disease, and which is generally in the lower animals entirely restricted to the uterus, is the most prominent, most extensive, and most serious of the whole. I have seldom met with an instance where the discharge was otherwise than occasional, and this

accounts for the non-affection of the cervix and vagina; for if the discharge were at all continuous the two latter could scarcely escape participating in the disease. The discharge may occur at intervals varying in duration from twenty-four hours to as many days; in general, however, the intervals are comparatively short.

The most distinguishing characteristic of real uterine leucorrhœa is the quantity and occasional fetid condition of the discharge. The quantity may vary from six ounces to as many quarts; and, commonly, the greater the quantity the more abominable the smell; this, however, is not invariably the case.

The severest cases of uterine leucorrhœa coming under my notice have occurred in mares. It is scarcely credible the quantity of fetid brownish-yellow material which, at intervals of a day or two or more, will be discharged from the uterus. In such instances the poor patient, unless very quickly relieved, rapidly loses condition, and actually becomes a pest, and a dangerous one too, to her attendant. I have known several horsemen whose hands and arms became seriously affected with an "*outbreaking*" through grooming and dressing at these leucorrhœal patients.

So much for the descriptive part of the disease. I will now proceed to notice what I consider to be the *cause* and *nature* of the three forms of leucorrhœa specified.

The causes may be divided into proximate and remote, or, as I am inclined to think may be said, local and constitutional. Indeed, it may be safely asserted, for example, that animals with a tubercular diathesis are exceedingly liable, on the slightest local encouragement, to become affected with leucorrhœa. I could quote many such cases.

The remote causes of leucorrhœa may be set down as the existence of tubercular and rheumatic diathesis, a lax state of the general system, or a vitiated state of the blood consequent on bad usage. The presence of any of these causes I have found very inducive of leucorrhœal discharges; that is, I mean that with the least local incentive, animals constitutionally affected as above described will, more readily than others, become the subjects of leucorrhœa.

Now, these local incentives constitute the proximate causes, and the list of such is by no means trifling or without variety. A good many proximate causes follow gestation and parturition, such as the effects of laceration of the cervix and vagina during delivery, or even a failure in the natural closing up of the parts after their extraordinary distension. Indeed, the parts often remain flaccid and loose, and

thus become the seat of slight chronic congestion or inflammation, which, of course, causes an extra and pathological secretion from the glands, follicles, and crypts of these passages; thus the characteristic of white curdy (chiefly mucous) discharge of leucorrhœa is produced, generally to be passed off during every micturition.

The same pathological conditions may occur in the uterus itself, from which, of course, the discharge will only take place at comparatively long intervals and in larger quantities, and where the cause is analogous the discharge will be, as usual, white in colour, curdy in consistence, and mostly mucous in nature.

In a great many cases, however, the discharge in uterine leucorrhœa will prove to be muco-purulent, and even entirely purulent, and in such instances the cause may be the irritation produced in the uterus by the retention of part of the placental *débris*, or, perhaps, the retention of part of the œstral discharge. Under either of these circumstances the amount of fœtor of the leucorrhœal discharges will be somewhat astonishing.

Where the discharge in any way partakes of a purulent character considerable thickening and even ulceration of the lining membrane and walls of the uterus will be found; a state of matters which is evidently induced by the continued acrid irritation of the retained decidua or œstral products.

Another fertile source of leucorrhœa, in my opinion, is the retention of the products of checked or destroyed fecundation. The vital principle of the early embryo by some means or another is destroyed, and the effete (dead) material thus produced creates, by irritation as a foreign body, an extra and pathological secretion from the glandular system of the uterus, which, uniting with the dead embryotic matter, goes to make up the usual leucorrhœal *flow*. Further, the retention for any considerable length of time in the uterus of this *flow* brings on, in the mucous membrane of the uterus, a chronic inflammatory action, which may end in indolent ulceration. Two of the worst cases of leucorrhœa which I have ever met were evidently of this origin; the patients were a mare and a quey, and they had both ultimately to be destroyed. The discharge from the mare was what I may call sanio-purulent, and was excessive in quantity and most offensive in smell. On *post-mortem* examination considerable ulceration was seen on the lining membrane of the uterus. The discharge from the quey was composed of yellowish putrid pus, very fetid, and creamy in consistenee. I may just say that there was no sign of *tubercle* in this

quey; the disease had arisen entirely from checked embryotic life.

The other proximate causes of leucorrhœa may be summed up as follows, namely, as a sequel of endometritis, as a sequel of purpura hæmorrhagica, as a concomitant of cancer in the uterus, as a product (by irritation) of miliary tubercular deposit on the inner surface of the walls of the uterus, and, finally, it may arise from polypus or fungous excrescence in the uterus.

The real *nature* of the disease is simply the production of a certain discharge, either mucous, muco-purulent, or purulent, according to the amount, character, and site of the irritation produced by any of the causes mentioned. The production of an abnormal and pathological fluid, of no invariably definite colour or consistence, is the chief characteristic of leucorrhœa, and an examination of this fluid will at once show the nature of the local causative disease. If the discharge be entirely mucous we have merely an unhealthy and over-secretion from the mucous follicles, glands, and crypts; if muco-purulent, slight chronic inflammation, and, perhaps, even ulceration will be present, and if altogether purulent, a greater or less degree of thickening, chronic inflammation, and ulceration, will be almost universally present in the uterus.

The *treatment*, or rather the *mode* of treatment, of leucorrhœal cases will, of course, vary according to their site and nature. Speaking in a broad and general way, I may safely say that I have found sulphate of copper to be a sort of *sine quâ non* in the treatment, both locally and constitutionally, of this disease. After thoroughly syringing out the affected parts with warm water, the injection of a weak solution of Cupri Sulphatis is very beneficial, and, in severe cases, drachm doses for a mare or cow of Cupri Sulph., morning and evening, will be found to have a very telling effect.

In uterine leucorrhœa the process of syringing out with warm water must be gone about with considerable tact and caution. It is best to do it immediately after one of the usual discharges, as the os and cervix uteri will then be partially dilated, otherwise the opening of these will create an untoward amount of irritation, and bring on rather severe pains. Having ascertained that the os uteri is in a relaxed or open condition, I introduce into the uterus a long elastic tube, which is fastened to the end of a common clyster-pipe or syringe, and thus inject as much warm water as the uterus will hold. As soon as I think the most of this injected warm water has escaped or been expelled from the uterus, I proceed in the

same way to inject a very weak solution of Cupri Sulphatis, and, if the operation of injecting the warm water has brought on any pressure or pains, I generally add some Tinct. Opii to the solution of Cupri Sulphatis.

This treatment must be repeated as often as necessary, at intervals of forty-eight hours. A modification of the same treatment will do equally well for vaginal and cervico-vaginal leucorrhœa.

In a few cases, where there was a good deal of fœtor, I have found it very beneficial to add a moiety of glacial carbolic acid (Calvert's).

There is a question very often put to me professionally, having reference to this subject, and that is, *whether a leucorrhœal patient is in calf or in foal*, as the case may be? I have always answered *no*, and as yet I have never been mistaken. I find, however, that such is not invariably the case in human practice. As a matter of course it must be understood that I do not here refer to mere vaginal leucorrhœa, but to the uterine and cervical forms of the disease; and I should feel extremely interested to have the experience on this point of some older and more experienced veterinarian than myself.

EXPERIMENTS WITH CARBOLIC ACID.

By P. Cullen, M.D., Calcutta.

Continued from p. 612.

17th February, 1871.—Dog, No. 8, about the size of a water spaniel. At 7.46 a.m. ʒss of acid was given in ℥ss of warm water. In thirty seconds he was staggering, in one and a half minute he was frothing at the mouth; in four minutes ten grains of carbonate of ammonia in half an ounce of water were administered, and two minutes afterwards he fell over and could not rise. The eyes were now examined and found bloodshot, with the pupils dilated. In ten minutes from the time of giving him the acid, a little cold water was sprinkled on his head and back, when he got up, and in about half an hour appeared all right again.

19th February.—At 7.16 a.m. forty minims of the acid were given in half an ounce of tepid water; the dog fell down as soon as he was let go. In thirty seconds ʒss of Spt. Ammoniæ Aromat. and ʒss of Spt. Æther. Nitr. in ℥ss of water were given, but without any apparent effect. There was violent emprosthotonos, the body being quite curved and his

tail as violently curved upwards; there was hoarse rattling in his throat, his eyes were bloodshot, and his tongue protruded. He died in ten minutes.

Post-mortem, at 5 p.m.—The skull and spinal canal alone were opened. Over the whole surface of the brain serous effusion existed, as also into the ventricles of the brain. The brain substance also exhibited numerous vascular points. The membranes of the cord were also very vascular, and the spinal vessels gorged with blood; but no change was noticed in the nervous substance itself.

3rd March.—Dog, No. 9, a puppy. ʒss of acid was given; he at once fell down convulsed, and died within ten minutes. A *post-mortem* was made one hour afterwards. The heart was full of dark fluid blood. The lungs also, together with the liver, were gorged with fluid blood. The kidneys were deeply congested, and the bladder full of dark urine, which smelt strongly of the acid. The vessels of the brain were also gorged, and there was a thick layer of albuminous effusion over the surface of the brain.

5th March.—Dog, No 10, as large as a pointer. At 7.6 a.m. forty drops of acid in half an ounce of water were given. He at once began to paw his mouth and in two minutes jumped up, broke his string, and ran, staggering, for about twenty yards, when he fell over, but was able to get up, and kept jumping in a gyrating manner for some time, with his hind legs well under him. The breathing was accompanied by a rattling noise in the throat. At 7.15 his bowels were moved; motion had scybalæ. He gradually recovered after this, and was all right in half an hour. On the 7th and 14th March respectively, ʒj of the acid in ʒss of water was given, with merely a repetition of the symptoms before described; there was no increase, and he recovered fully in half an hour each time.

3rd April, 6.15 a.m., ʒiss of acid in tepid water was given. In thirty seconds the dog staggered and fell, but was able to rise. His breathing became heavy, and in another thirty seconds he again fell over and was then unable to rise. His pupils were now found widely dilated, but eyes not particularly red. The spasmodic action of the limbs was continuous and strong, and body curved into a ball-like form. At 6.40 he began to revive, and in another hour's time appeared quite recovered.

4th April, 6.22 a.m., ʒij of acid were given in tepid water, when he fell down at once; the breathing became stertorous, eyes bloodshot and pupils widely dilated, with the tongue somewhat protruding; spasms of limbs strong, and body

curved. He lay in this state until 9 a.m., when he sat up and drank a little water, but again fell over, and lingered until 2 p.m., when he died. A *post-mortem* was made at 5 a.m. The brain was covered with serous effusion, and vessels gorged with fluid blood. The vessels of the spinal cord were also gorged, and on cutting across the cord, in several places numerous red points were seen. The thoracic and abdominal viscera were distended with dark fluid blood, and the intestines (lower) contained dark fæces.

Summary.—Having commenced these experiments with the view of ascertaining the maximum safe dose of this acid, and its action on the system when given in large doses internally, I think I have gone far enough to satisfactorily settle these points; but when, in the course of my labours, I saw results somewhat contrary to what authors have ascribed to carbolic acid, I was led to give the details of the trials, so that others interested in such investigations might themselves judge of my conclusions. This, I beg, may be accepted as an excuse for having imposed on them the uninteresting accounts of each dose exhibited. I will now endeavour to give my opinion of the physiological effects of this most powerful and valuable drug, so far as I have been able to satisfy myself as to its action. All the experiments have been with crystallized acid.

First, then, as to the dose. At the commencement I began with a very small dose, and gradually increased it drop by drop, and it was not until I had given fifteen minims three times a day that I noticed any particular effect. After the third of such doses, given on the same day, there was noticed some heat and irritability of the mouth and stomach, as shown by the dog putting his nose into and lapping water, but yet in a manner that showed he was not thirsty. Twenty minims, thrice daily, caused decided agitation, which, however, wore off in a short time, and any increase on this dose was attended by more and more severe symptoms, up to perfect insensibility, with stertorous breathing, bloodshot eyes, dilated pupils, and loss of muscular power, but even these symptoms wore off within the hour if the dose was not fatal. The smallest fatal dose was half a drachm, given to a half-grown puppy (dog No. 9) and to dog No. 5, which killed them within ten minutes; whilst forty minims killed dog No. 8 in the same time. This was the shortest period in which death occurred. It will have been seen from my first cases that if the dose was very gradually increased, a tolerance of the drug resulted, and as much as a drachm might be given with merely evanescent symptoms.

I need not say anything about the larger doses, as any quantity above fifteen to twenty minims will give rise to severe symptoms, and half a drachm will probably prove fatal.

Antidote.—There is no time to exhibit any. The action of the drug is so rapid that there is not time to take any steps. If the person who has taken a large dose be seen at once, immediate vomiting should be induced by tickling the fauces or by the use of the stomach pump. Cold applied to the head, a little brandy given, and, perhaps, artificial respiration might be useful. Ammonia, either as the carbonate or as the aromatic spirits, did not appear of use. Oil given with the acid greatly neutralised its effects, but given afterwards had little or no effect; nor had milk or white of egg.

Action.—The action of carbolic acid appears almost similar to that of prussic acid. It affects with nearly equal rapidity, but whilst, in poisoning by prussic acid, stertorous breathing seems to be the exception, with carbolic acid heavy sighing (dog, No. 6) is exceptional, and stertor the common symptom. The fluid state of the blood, universal congestion of the organs, and serous effusion over the surface and into the central cavities are also concomitant symptoms, as are also the staggering gait, foaming at the mouth, and loss of control over the muscles of locomotion. The acid also seems to have a paralysing effect on the involuntary muscles, as seen in the dilated and flaccid heart, dilated blood-vessels, distended bladder, &c., and the entire check of the secretions of the intestinal canal; the contents, whenever examined, have been found hard and scybalous, or thick and ropy—the congestion of the intestines being more severe where the acid had been given for some time, than when administered in one fatal dose. By check of secretions I mean their non-discharge into the intestines, as the gall-bladder was usually found distended with dark bile. In the human being I have tried carbolic acid in several cases of local complaint with advantage; my opinion is that in dyspeptic diarrhœa, where there are frothy fermenting stools, it acts as an antiseptic as well as a sedative. In dysentery, attended with discharges of mucus, and mucus with blood, it relieves the spasms of the intestines by its sedative action; and given with mucilage and small doses of tincture of opium, I have obtained good results; but when given in five or six minim doses three times a day, the patients, after the third or fourth day, have complained of a sinking, fainting sensation at the epigastrium, and almost every patient complains of its producing a soreness in the mouth (but not the teeth-on-edge acidity of the mineral acids), and an increased flow of saliva.

Hence, I would not advocate a larger dose than five minims, if to be repeated three or four times during the day; and I must add that I am not satisfied that it would be equally beneficial in cases of acute dysentery. One of my hospital assistants, at my suggestion, tried it in cholera, and states that it checked the vomiting; but I have no personal experience on this point.

Externally, I have tried it extensively on foul ulcerating sores, and with benefit; but in one case, when using one part of acid to ten of water, to a large sloughing surface, symptoms of agitation, with fluttering of the pulse, difficulty of breathing, and failure of the heart's action ensued, but were combated by lowering the patient's head, giving brandy, and inhaling carbonate of ammonia, with cold effusion to the head. This proves that even its topical use requires care; and although the whole body might be smeared with an ointment of the acid in a case of confluent smallpox (as recommended by Dr. Aitchison), yet in a mild case, where the absorbent power of a large portion of the skin remains unimpaired, such a proceeding would be attended with risk. My experience of its use in leprosy is limited, but so far not encouraging. Such, briefly, are the results of my experiments, and in making them known I do so, not as proved conclusively, but rather to encourage further research, which may either confirm or modify them.

Note by Mr. R. S. Hart, M.R.C.V.S.

I have given the experiments (by P. Cullen, M.D.) *in extenso*, and in an ensuing number of the *Veterinarian* I will endeavour to give a memo. of my own experience of carbolic acid, the agent having been used by me for a period of four years or more. I shall then show that carbolic acid, particularly Calvert's No. 5 fluid, is an invaluable and economic drug, and should in consequence occupy a space in every veterinarian's pharmacy.

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 727.)

The last that we shall name of the fine assemblage of trees belonging to the order *Corylaceæ* is one of the finest in the whole series, if not the true monarch of the woods. We

have only to mention the name of the oak to rouse up a thousand memories in the minds of all.

The poet bursts into song in praise of his favourite tree; the landlord delights in its spread of trunk and branch upon his broad acres, and time was—and even now, in this age of iron, the feeling is not extinct—that our safety as a nation was considered to be mainly due to the "wooden walls of old England," when made of good honest English "heart of oak."

But though in ship-building wood has been greatly superseded by iron, the oak is still our most valuable timber-tree, whether for wear and hard work, or for substantial furniture or ornamental purposes.

In fact, were we to dwell upon all the good things said and written upon this tree we might fill a volume; but we would rather refer to those more practical facts connected with the native forms of the tree and the uses of its wood, bark, &c.

Any observer of the oaks to be met with in different parts of our country will conclude that, if we do not possess more than a single species, this has a tendency to run into well-marked varieties, the best marked of which may be described as follows:

1. *Quercus robur pedunculata.*—Fruits (acorns) placed on *pedicels*—footstalks of from one to more than three inches in length.

Leaves on very short *petioles*—leaf-stalks.

2. *Quercus robur sessiliflora.*—Fruits on exceedingly short footstalks, nearly, if not quite, sessile.

Leaves with a decided petiole, more than an inch long.

3. *Quercus robur intermedia.*—Fruits on footstalks of from half an inch to an inch in length.

Leaves with a petiole scarcely an inch in length.

In all respects intermediate between the first two.

Of these three varieties—for they are nothing more—of British oak, the first is the larger form, according to our own observations; but still we have seen mighty giants of them all; but, perhaps, the more aged examples, and, consequently, the most gnarled and conspicuous trees, may mostly be referred to the *Q. robur pedunculata*, which in some of our forests present remarkable trees; thus, some giants in Alice Holt Forest and in the Forest of Dean, with scattered veterans standing here and there where forest once extended, show the age and size to which these remarkable trees may attain. So old, indeed, are they that they were marked trees centuries ago, and then of sufficient size to be known as land-

marks, or to stand as witnesses of particular events; thus, we have Gospel oaks, and my friend Edwin Lees speaks of an oak at Malvern in the following words:

"As forming a good picture of sylvan scenery, 'The Grove' at Little Malvern may be referred to, on the eastern edge of which is a fine spreading oak, known as 'THE BENEDICTINE OAK,' which, had it the faculty of Tennyson's 'talking oak,' would doubtless bear witness to the colloquies of monks from the adjacent priory. Though this particular oak can only make pretension to have had Benedictine monks under its branches when Little Malvern Priory was intact, yet in those days there were older patrician trees existing going much further back into 'the times before them,' and of the priory itself it might then have been justly said, in the words of Byron—

> "It stood embosom'd in a lonely valley,
> Crown'd by high woodland, where the Druid oak
> Stood like Caractacus in act to rally
> His host with broad arms 'gainst the thunder-stroke,
> And from beneath his boughs were seen to sally
> The dappled foresters."
>
> *Trans. Malvern Field Club*, p. 83.

A fine tree of the *Q. robur intermedia*, probably as old as five centuries, occurs at Clifton Mabank, Dorset; it measures twenty-eight feet in circumference at a yard from the ground, and has all the giant aspect of the commoner form.

As regards the *Q. robur sessiliflora*, we know of no trees of the age of the commoner forms. Both in Alice Holt and Wyre forests this form abounds; and though they are handsome trees, yet their size and general smoothness of outline show them not to be so old as the more veteran *Q. robur pedunculata*. At the same time there is reason to think that all the forms mentioned were always common to our island; but the greater straightness and length of bole of the *Q. robur sessiliflora* point it out as the best adapted for the timber work of the middle ages, and hence we find it adopted in some of our earlier ecclesiastic and monkish buildings, used for roofs for large halls—notably Westminster Hall—barns, and the like, of which some of the tithe barns belonging to the old abbeys are often found examples of timbered roofs, one of which, at Bredon, in Worcestershire, was capable of admitting six-and-thirty waggon loads of corn to be sheltered side by side, a no bad building in "catching weather" in which to secure the ecclesiastic provisions.

The uses of the oak and other plants of the order are very clearly summarised by Dr. Lindley:

"An order which comprehends the oak, the hazel-nut, the beech, and the Spanish chestnut, can scarcely require much to be known to a European reader of its properties, which are of too common a use to be unknown even to the most ignorant. Whatever excellence may be found in the timber of the European species is not at all inferior to that of hotter countries. Blume tells us that his *Lithocarpus javensis* is called Passan-batu, or stone oak, because of its hardness. The leaves of *Quercus falcata* were employed, on account of their astringency, externally in cases of gangrene; and the same astringent principle which pervades all the order has caused them to be employed even as febrifuges, tonics, and stomachics. Cork is the bark of *Quercus suber;* it contains a peculiar principle called Suberin, and an acid called the Suberic. The galls that writing ink is prepared from are the produce of the *Quercus infectoria*, from which they derive their astringency. The acorns of a species known in the Levant under the name of Velonia (*Quercus ægilops*) are imported for the use of dyers. The fixed acids, called Quercitannic and Gallic, which have the power of guarding animal and vegetable fibre from decay, are abundant in many of the oaks, whose bark is therefore invaluable for tanning. The yellow dyeing bark, called Quercitron, belongs to the *Q.tinctoria*. The husks of the common beech-tree yield a narcotine extractive called Fagine. The sweetness of Spanish chestnuts and filberts are not confined to the nuts of those trees; the other species of Corylus resemble them in that respect, as do the beech and many sorts of oak, especially *Q. gramuntia*, whose acorns are the Belotes of Spain, and a variety of *Q. sessiliflora*, which is believed to be the Æsculus of Vigil. The bark of the oak has been employed as a coarse kind of febrifuge. In hot weather a large quantity of saccharine matter is secreted by the leaves of *Q. mannifera*, in Koordistan, where it is made into sweetmeats. Oil is obtained from the seeds of some species, such as the beech and the hazel-nut."—*Vegetable Kingdom*, p. 291.

As regards the mast or seeds of the oak, it is well known that some years it is so abundant as to be largely used as cattle-food; this was the case in 1870, and as great diversity of opinion existed as to their qualities, experiments were then carried on which were fully reported in our Journal. As referring to the sweet principles already adverted to as being found in the seeds of some species, it should be noted that when fully ripe, and especially in the germinating process, much sugar is developed, which points to this semi-malting of acorns as of some importance in feeding with them.

Oak bark for tanning is a valuable article of commerce, so much so that we have ere now obtained more for the bark stripped off felled oak than for the timber. Oak bark is employed for medicinal use in both schools, and the following succinct description of "Quercus cortex" and its uses, in Tuson's 'Veterinary Pharmacopœia,' will not be out of place here:—"The dried bark of the small branches and young stems of *Quercus pedunculata* collected in spring from trees growing in Britain.

"COMPOSITION.—Its medicinal activity depends upon its containing fifteen to twenty per cent. of tannic acid, with a small quantity of gallic acid.

"CHARACTERS.—Covered with a greenish shining epidermis; cinnamon-coloured on the surface, fibrous, brittle, and strongly astringent.

"ACTIONS AND USES.—*Internally:* astringent and tonic. Employed to arrest diarrhœa, dysentery, and similar mucous discharges. *Externally:* astringent, styptic, and excitant. Occasionally used for stimulating unhealthy wounds and arresting gangrene, also in prolapsus recti and prolapsus uteri.

"DOSES.—*Horse,* 2 to 6 drachms. *Cattle,* 2 to 6 drachms. *Sheep,* ½ to 2 drachms. *Pig,* ½ to 2 drachms. *Dog,* 10 to 30 grains.

"MODES OF APPLICATION.—*Internally:* The powdered bark made into a bolus, or mixed with gruel, but preferably in the form of Decoctum Quercûs. *Externally:* The powder or Decoctum Quercûs.

"PREPARATION.—"Decoctum Quercûs."

But there can be little doubt that the most active remedial agent will be found in nut-galls, speaking of which the author just quoted states that—

"Their therapeutic properties are chiefly due to their containing about twenty-six per cent. of tannic acid, $H_3C_{27}H_{19}O_{17}$, with a trace of gallic acid, $H_3C_7H_3O_5$. Aq. This gallic acid has been used in photography, and it is the well-known basis of ink."

As regards galls, it should be stated that within the last few years our English or native oak has been attacked by an insect before altogether new to us, of which a gall is formed, which we have tracked in its spread from Devonshire, where it was first observed, from the west into Dorset, Wilts, Gloucester, to the East Coast, and since then into North Wales; in fact, it now seems to be pretty general. These galls are due to the *Cynips quercus petiolati*, and it would appear that what would otherwise be leaves is converted into these excre-

scences, externally so much like smooth nut-galls as often to be difficult to distinguish them unless weighted and carefully examined.

These galls, however, do not contain the quantity of gallic acid that the Aleppo galls do. Still, we have employed them in making ink, and formed a fluid sufficiently black to write with, at the same time it wants much more than the nut-galls; but still we think these native galls might be utilised, and if so their collection would do good service, as the trees, or rather shrubs, for it is in this state they do mischief, are much injured by their presence.

SUPPOSED POISONING OF PIGS BY THE COMMON CONVOLVULUS.

By Harry Olver, M.R.C.V.S., Tamworth.

In your editorial remarks on a case headed as above, reported by me in the *Veterinarian* of last month, you say that you are "disposed to attach great importance to the pigs having freely partaken of the potato tops;" as "they belong to the poisonous order *Solanaceæ*." I am not at all surprised at your having expressed such an opinion; but I think that if you had seen the crop in question you would scarcely have so thought, as the potato tops were quite insignificant in number, compared with the convolvulus with which they were mixed. The tops, moreover, were not green, unripe, and watery, at least not to the extent one would naturally suppose. They were the tops of that very early potato the ashleaf-kidney. When growing with the convolvulus they could scarcely be seen.

For these reasons it appears to me to be difficult to understand how the comparatively small quantity of potato tops should have had such an unusually deleterious effect, especially when we know that the pigs, contrary to their usual habits, had partaken of such a large quantity of the convolvulus.

I have been induced to add these further particulars in consequence of your remark, that from your present amount of information you were inclined to hold the opinion that the potato tops were the cause of death. The relation of the case will, I hope, be the means of our finding out whether or not the common convolvulus is poisonous to animals.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of September, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Carentan .	Southampton . .	Foot-and-Mouth	...	...	...	6	6	6
Cherbourg	Shoreham.	,,	1	...	...	...	1	1
Hamburg .	Hartlepool	,,	4	9	...	...	13	13
,,	Hull	,,	158	8	...	...	166	166
,,	London .	,,	51	181	...	...	232	232
,,	Middlesborough	,,	3	...	...	...	3	3
,,	Newcastle-on-Tyne	,,	74	...	...	...	74	74
Harlingen.	Hull . .	,,	12	4	...	11	27	26*
Honfleur .	London .	,,	5	...	...	...	5	5
,,	Shoreham.	,,	3	...	...	...	3	3
Husum .	London .	Pleuro-pneumonia .	18	...	...	...	18	18
Nordenham . .	Hull . .	Foot-and-Mouth	16	8	...	...	24	24
Tonning .	London .	,,	...	117	...	...	117	117
Total . . .		Foot-and-Mouth	327	327	...	17	671	670*
		Pleuro-pneumonia .	18	...	...	...	18	18
Total			345	327	...	17	689	688*

"Privy Council Office,
"Veterinary Department, 14th October, 1872."

"ALEXANDER WILLIAMS,
Secretary.

* One animal died at the place of landing.

CATTLE PLAGUE.

The stamping-out process has not been so rapidly successful as we had a right to anticipate, and as it would doubtless have proved had it been promptly and thoroughly adopted. After the destruction of Mr. Berriman's herd at Yapham in the Pocklington district, there remained three herds which had been grazing in three several pastures immediately adjacent to that which the sick animals had occupied. We had the strongest reason to suspect that some of these animals had been exposed to infection, and accordingly did not hesitate to advocate their destruction. Prejudice and law were both against the advice tendered, and the animals were consequently left until they took the disease, and were then slaughtered in accordance with the provisions of the Act. This, however, unhappily did not provide a sufficient barrier to the progress of the *contagium*, and hence the plague, which might have been arrested by the slaughter of a score of cattle, has up to this time continued to attack the stock over a constantly extending area.

Ten days from the slaughter of Berriman's herd the disease appeared among cattle belonging to Mr. Towse, Mr. Craddock, and Mr. Kirby, at Yapham, and between twenty and thirty animals had to be sacrificed to the outbreak. Then the disease appeared at Belthorpe, also in the infested district, where it necessitated the destruction of thirty-seven cattle. On October 1st cattle pague was found at Tangfoss, outside the infected district, among animals belonging to Mrs. Bielby. Ten days also after this event the plague was detected on Mr. Burnely's farm at Garrowby, five miles from Pocklington, and two miles from any known centre of infection. Again, on October 14th, a cow belonging to Mrs. Dale, at Skirbenbeck, was attacked, this place being about two miles from Garrowby; and again, on October 18th, a case occurred at Belthorpe, which has since been followed by two other outbreaks, leading to the destruction of eleven cows and eight calves besides the animals attacked. At Bridlington and Patrington no fresh cases have been reported recently, and it is hoped that the measures adopted there have now been successful in arresting the further spread of the malady.

Hereafter it will be necessary to correct many of the errors which exist with regard to this outbreak of cattle plague in Yorkshire, as well as the numerous misstatements which have been perseveringly promulgated. Now

we only think it worth while to say that there is not a word of truth in the statement that the carcases of the cattle plague animals at West Hartlepool were sent out to sea, and were, as at Hull, afterwards washed ashore. The fact is, all the carcases of the supposed healthy as well as the known diseased and all offal, were buried on a piece of land called the "Slake," where they rest undisturbed to this day.

On the Continent the cattle plague is still rife in Russo-Poland, in the Government of Lublin; also in Scutari and the surrounding villages, as well as in Salonim. On September 23rd another outbreak of the disease was reported from near Hamburg. The malady appeared among cattle in a field not far from the town. It was suspected in this case that the infection had been conveyed by persons passing through the field, as the previous case had happened at a place a mile distant. The cows, sixteen in number, and two others in an adjoining field, were killed and buried; and all the cattle round the infected spot immediately housed and placed under a strict watch. No further outbreak has since been reported.

SHEEP POX.

Since our last report we have intelligence that this disease is spreading in Pomerania, and that seven districts in the Government of Köslin are now infected. The malady has also extended the area of its infection in Sweden.

FOOT-AND-MOUTH DISEASE.

There is little or no diminution, as far as we can learn, either in the extent of the existence, or in the virulence of the foot-and-mouth disease in this country or in Ireland. Again it is reported that deer have contracted the disease, and this time in the Home Park at Hampton Court; the former outbreak being among the animals in Bushy Park. On the Continent the malady is extensively prevalent, more especially in Schleswig-Holstein.

PLEURO-PNEUMONIA.

In various parts of the country the contagious lung distemper continues to produce considerable mischief, but there has not been such an increase of the disease anywhere as to call for special notice. Many outbreaks are undoubtedly kept secret, but making due allowance for the suppression of much information, which is only to be obtained by close inquiry, we do not apprehend that there is anything alarming in our present situation in regard to this disease.

Contagious pleuro-pneumonia exists among cattle in some parts of the Continent, and probably to a serious extent in Holstein. Recently animals affected with the disease have been landed in the country from Husum, as appears in the official return.

GLANDERS.

The unusual prevalence of this disease to which we recently directed the notice of our readers still demands very serious attention. For a very long period we have not known so many cases of glanders and farcy to exist among the horses in and around the metropolis. Few of these cases are reported officially, and as the "Contagious Diseases (Animals) Act" does not recognise farcy as being identical with glanders—a mere variety in fact of the disease—so the owners of "farcied horses" do not trouble themselves about the requirements, and fines, and penalties of the law. As long as this state of things continues, so long shall we witness periodic outbreaks of this malignant and contagious malady.

OUTBREAK OF INFLUENZA AMONG THE HORSES IN NEW YORK AND OTHER AMERICAN CITIES.

The accounts which have reached us from New York with regard to the prevalence of influenza among the horses in that city and Boston represent the disease as having reached most alarming proportions without there being, at present, any indications of its abatement. The great towns of

England have often suffered in the same way; but until recently America would seem to have been a stranger to the malady in its malignant form. Hereafter we may hope to receive valuable reports from some of the members of the veterinary profession in America, not only upon the extent of the disease, but upon its pathology and the secondary causes which have been in operation in its production. Where these things have not been well understood, or the treatment of the animals confided to farriers and uneducated cattle doctors, the fatality has reached a large *per centage;* while on the contrary the deaths have been few when scientific veterinary surgeons have had the care of the cases. As in England and elsewhere, the fever has been found to yield only to the supporting and invigorating system; the use of depletives invariably protracting the cure, or bringing on a fatal result. Thirty thousand horses, according to the latest information, are said to be suffering from the malady, and the greatest possible inconvenience and heavy losses are being sustained for the want of horse labour in transporting goods and merchandise. It is even reported that many of the European steam-vessels are leaving New York with half cargoes.

Facts and Observations.

The Crystalline Principle of Aloes.—Natal aloes, moistened with spirit and submitted to microscopical examination, exhibits the presence of crystals of a compound which is but slightly soluble in alcohol, so that, on treating the aloes with its own weight of that solvent at 120° F., the crystalline principle, which the author calls nataloin, is readily obtained in a crude state. When purified by crystallisation from hot spirit, it forms thin, bright yellow scales, sparingly soluble in water, benzol, carbon disulphide, chloroform, and ether. Nataloin, $C_{34}H_{38}O_{15}$, contains no water of crystallisation; it melts between 356° and 374·5° F., dissolves in concentrated sulphuric acid, and the addition of a crystal of potassium nitrate to this solution produces a characteristic bright green coloration, rapidly passing through red to blue. Heated with nitric acid it is decomposed, yielding oxalic acid without a trace of picric or chrysammic acid, thus showing a remarkable difference from aloïn. The author was unsuccessful in his attempts to obtain a bromine substitution-compound;

neither did the action of dilute sulphuric acid or that of zinc and acetic acid on the compound give any satisfactory results. By washing Zanzibar aloes slightly with dilute spirit, the author has obtained crude Zanzibar aloïn, which when purified by crystallisation from spirit, formed tufts of needles. It is far more soluble than nataloin, and contains water of crystallisation, $C_{34}H_{38}O_{15} + 5H_2O$, which it loses when dried over sulphuric acid, leaving anhydrous Zanzibar aloïn, $C_{34}H_{38}O_{15}$, isomeric with the crystalline hydrated aloïn of Stenhouse. As the author has not succeeded in obtaining a bromine substitution compound from it, and as it does not give the deep red colour with nitric acid which ordinary aloïn from Barbadoes aloes does, he considers it possible that it may be different from the latter.—*Journ. of Chem. Soc.*

The Aconite Alkaloids of Hubschmann, Napelline and Lycoctonine, and their Physiological Actions.—Hübschmann extracted from crude aconitine, obtained from *Aconitum napellus*, an alkaloid, napelline, differing in its solubility in water from aconitine; and subsequently from lycotonum-root two alkaloids, acolyctine and lycoctonine, the first of which he found to be identical with napelline. The author obtained these bases by treating the alcoholic tincture of the root with lime, then with sulphuric acid; evaporation of the alcohol, and solution of the residue in water, whereby resinous matters were separated; decolorisation with purified bone-charcoal; evaporation to dryness after addition of sodium carbonate to strongly alkaline reaction; exhaustion with alcohol; and finally separation of the two bases by ether, in which lycoctonine is readily soluble, whereas acolyctine is insoluble.

Acolyctine thus obtained is a white powder soluble in water, alcohol, and chloroform, but insoluble in ether; it forms white precipitates with tannin and lead acetate, and yellow with gold chloride; its sulphate precipitates white with ammonium molybdate. Lycoctonine forms white prisms and crystalline needles of intensely bitter taste, soluble in alcohol, chloroform, ether, benzol, amylic alcohol, petroleum spirit, oil of almonds, and oil of turpentine; only sparingly soluble in water (1 part in 800 at 17°); its aqueous solution gives a yellow precipitate of microscopic needles with bromine water, and a thick precipitate becoming crystalline on standing with potassium-mercury-iodide.

A large number of physiological experiments were made on men, rabbits, and frogs, with these results; acolyctine is not identical with napelline, but has only about one third as

energetic an action; lycoctonine is about as energetic as acolyctine, the action of each being analogous to that of aconitine. No analytical numbers are given in the paper.

Further experiments are given in a subsequent paper by the author, entitled "On the Active Ingredients of *Aconitum lycoctonum*, on *Aconitum napellus*, and *Morson's Aconitine* (Pseudaconitine)." (N. Repert, Pharm., xv, 705.)—*Ibid.*

Composition of Urine.—In a paper recently published, Wanklyn gives the result of some interesting experiments he has made on the chemical examination of urine. Pointing out the fact that determinations of the specific gravity of urine are frequently faulty through inattention to the temperature, and that a slight difference in specific gravity corresponds to a great alteration in solid contents, he recommends that they should be replaced or supplemented by the determination of the solids left on evaporation, and the ash left on incineration. He also recommends operating on small quantities, and states that although the urine varies, the proportion between the organic matter and the mineral matter in healthy urine is remarkably constant. Thus, in five cases where 100 cubic centimetres of urine of healthy persons were examined, he found:—

	Mineral matter.	Organic matter.	Ratio.
I.	1·50 grams.	2·53 grams.	1 : 1·69
II.	1·40 „	2·34 „	1 : 1·67
III.	1·48 „	2·38 „	1 : 1·61
IV.	0·60 „	0·80 „	1 : 1·33
V.	2·00 „	2·40 „	1 : 1·20

In these specimens the proportion of organic matter to ash never exceeded 1·7. But in some urine from a patient suffering from a disease of the kidneys, the quantities of mineral and organic matters in 100 cubic centimeters were—mineral matter, 0·63 grains; organic matter, 2·03 grains: ratio, 1·00 to 3·22.—*Ibid.*

New Method of Demonstrating and Measuring the Action of Pepsin.—In order to make the action of pepsin visible to a large class, the author recommends that a piece of thoroughly moist blood-fibrin be placed in 0·2 per cent. hydrochloric acid, till it swells up to a stiff jelly, and then laid on a funnel either with or without a filter. After the superfluous acid has drained off, a few drops of the digestive fluid, such as glycerin extract of pepsin are to be added to the jelly with a pipette. In about two minutes the fibrin becomes liquefied by conversion into peptone, and begins to

drop from the funnel. The rapidity with which the drops fall indicates the intensity of the digestive action. To show the comparative digestive powers of concentrated and dilute solutions of pepsin, equal quantities of the fibrin-jelly are to be laid on funnels of equal size, and equal quantities of the different digestive fluids added to each. The more dilute the solutions, the more slowly do the drops fall. To show the influence of temperature on digestion, pieces of fibrin are to be laid in funnels in the same way, one being kept at the temperature of the room, and the others warmed to the desired degree by a sand or water-bath, with a perforated bottom and then the digestive fluid added. The rapidity with which the drops fall increases with the temperature up to a certain maximum, above which it sinks rapidly, and cannot be brought up to its former rate by rapid cooling.—*Ibid.*

Atheroma in the Arteries.—Dr. Moxon has been making some recent researches on this subject, which are of importance. He shows the connection between inflammation of the arterial tunics, atheroma, and aneurism, and he dwells upon, and accounts for, the relatively greater frequency of the latter affection among soldiers. Dr. Moxon holds (1) that what is called atheroma of arteries is sub-inflammation of various degrees, of which the lower degrees end in fatty degeneration of the coats, along with the inflammatory products; and (2) that the determining cause of this change is mechanical strain, a general altered nutrition—such as obtains in gout, syphilis, &c.—being regarded in the light of a predisposing cause.—*Lancet.*

Preservation of Grain in a Vacuum.—The storing of grain, biscuit, or flour, is attended with considerable loss, chiefly from the attacks of weevils. The author proposes to store grain, &c., in large, upright, iron cylinders, having openings at top and bottom for the entrance and exit of material. When these are filled, a vacuum of about 10 cm. is produced in the cylinders by means of an air pump; this effectually destroys insect life, and also dries grain which might have been stored in a damp state. The result is a perfect preservation of the material.—*Ibid.*

THE VETERINARIAN, NOVEMBER 1, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

THE OPENING OF THE WINTER SESSION AT THE ROYAL VETERINARY COLLEGE.

ON Tuesday, October 1st, the winter session at the Royal Veterinary College was opened, the inaugural address being delivered by Professor Brown to an audience which numbered upwards of 250, composed mainly of members of the profession, old and new students, professional and personal friends, &c.

Sir James Tyler, one of the Vice-Presidents of the College, occupied the chair, and in a few and appropriate words introduced the lecturer to the class.

The address, which we publish *in extenso* from the short-hand writer's notes, dealt with the controversial subject of science and practice; the conclusion which was pressed on the attention of the student was in favour of a close pursuit of science during the period of pupilage, the presumption being that practical skill and experience would necessarily be acquired in time, while science neglected at the commencement must, for want of subsequent opportunity for study, be entirely abandoned.

At the conclusion of the lecture the prizes and certificates of merit were delivered to the successful competitors for the Coleman prize; also certificates of office-holding to the gentlemen who had acted as monitors during the session 1871–2, they having obtained the diploma of the Royal College of Veterinary Surgeons.

The meeting was attended by the entire staff of the College, many visitors, and friends of the freshmen, which may be said to have represented the general public.

The Governors of the Institution were represented by Sir James Tyler and J. Wilkinson, Esq., Principal Veterinary Surgeon to Her Majesty's Forces.

The Edinburgh College by Principal Williams and

several distinguished members of the profession who had been pupils at that school.

The Council of the Royal College of Veterinary Surgeons was also well represented, and besides the President, M. J. Harpley, Esq., and the Secretary, Mr. Coates, we noticed Messrs. G. Balls, J. C. Broad, H. J. Cartwright, J. Cowie, E. C. Dray, W. Field, jun., G. Fleming, T. W. Gowing, T. Greaves, C. Lowe, J. Moon, and R. Pritchard.

Of army veterinary surgeons, besides some already named as members of council, &c., there were present Messrs. Byrne, Hanley, Jones, Masters, Phillips, Steel, Tatam, Varley, and Woods.

Of town and country members there was a large attendance. Among those who were recognised by us were Messrs. Avis, Barford, Batt, Brown, Caton, Clarke, Emms, Gowing, jun., Gresswell, Hancock, Jarvis, Lawrence, Martin, Matthews, Norris, Priestman, Raymond, Rowe, Rushall, Simpson, Withers, Woodger, Tegg, and others whose faces met our view, but whose names were lost to us.

The day's proceedings were fitly brought to an end by an invitation being given by the Principal to all present to partake of luncheon, which had been provided in the official rooms of the College.

Review.

Quid sit pulchrum, quid turpe, quid utile, quid non.—Hor.

Cooley's Cyclopædia of Practical Receipts. Fifth Edition. Revised and partly re-written by Richard V. Tuson, F.C.S. London: J. and A. Churchill. 1872.

This, the last edition of a well-known work of reference, designed originally as a comprehensive supplement to the pharmacopœias and general book of reference on medical, manufacturing, and household subjects, has had the advantage of a thorough revision, and of the scientific portion being brought

into accordance with the great advance made in the various branches during the last few years.

One of the most noticeable features of this new edition is the adoption of a uniform type, and the restriction to their proper places and purposes of the perplexing varieties of type so extensively used in the former editions. This change renders the reading of the work more pleasant and much less fatiguing, while the improvement in the appearance of the pages is very marked. We regret, however, to see that this has not been so uniformly effected in the first portion of the work as we would have desired, and is very noticeable in the otherwise excellent articles on "acetic acid," "acetimetry," and "alcoholmetry." We also notice that although the articles are in exact accordance with the most recent progress in chemistry, yet in a few cases discrepancies in nomenclature occur, possibly, however, ascribable to the difficulties of reconciling the various systems adopted in the different pharmacopœias.

The work contains, besides the chief preparations of the old colleges, all the additions and alterations in the British and foreign pharmacopœias, including the recent ones of India and the United States, as well as the various veterinary medicines.

We notice with satisfaction the curtailment of the long articles on the nature and treatment of the various diseases; the editor justly remarking, "it was thought that those in former editions might in many cases be productive of more harm than benefit to those for whom such information was compiled, namely, emigrants and others not within the reach of the surgeon or physician." There is, however, a great addition to the useful medical information, more especially to the veterinary branch.

The editor has been assisted in his labours by the co-operation of various gentlemen in those branches of technical subjects where such has been advisable. For instance, in those on duty-bearing and excisable articles, where it is of the greatest importance to have an authoritative treatment, all have passed under the revision of Mr. Harkness, of the Inland Revenue. Other of the articles, as on "brewing," "bread," &c., are specimens of what cyclopædic writing should be, being concise and thoroughly exhaustive of the practical portion of the subject. We notice, however, a few articles that should be omitted in a future edition, as, for example, "ablution," and some others.

An established and well-known work of reference like "Cooley," however, does not require recommendation, and even a mere outline of all the subjects treated on would be impracticable in a work of such magnitude—some twelve hundred pages. We have therefore confined ourselves to a few of the most marked improvements in this edition, which, while handier and neater,

contains even more complete and accurate information than any preceding one. As a work of reference it should be on the shelves of all, as being indispensable to those especially who have any connection with medicine, or the manufacture connected therewith.

Extracts from British and Foreign Journals.

SPONTANEOUS MOVEMENTS IN PLANTS.

By Alfred W. Bennett, M.A., B.Sc., F.L.S.

That there are no "hard and fast lines" in Nature is a truth which is more and more forcing itself upon the minds of men of science. The older naturalists delighted to circumscribe their own special domains within sharply marked boundaries, which no trespassers were allowed to pass. We have long given up the attempt thus accurately to map out the kingdom of Nature. Her varied productions are connected with one another by innumerable links and cross-links; and our systems of classification, even the most "natural," are but an imperfect human contrivance for bringing together those forms which present the most evident marks of resemblance or affinity. While the truth of this law is most familiar in the case of those smaller subdivisions of the animal and vegetable kingdoms—classes, orders, and genera—which are connected with one another by innumerable intermediate forms, it is none the less certain in the line of demarcation which separates these two great kingdoms themselves from one another. In attempting to draw up a definition which shall serve accurately and infallibly to distinguish between the animal and vegetable kingdoms, we find ourselves compelled to abandon one supposed crucial test after another, and to content ourselves at last with framing, as in the case of the lower subdivisions, an assemblage of characters, by the *tout ensemble* of which we must decide whether our organism is an animal or a plant. So great is the uncertainty as to the actual boundary-line, that large groups of lowly organisms, such as those known as Diatoms and Desmideæ, have been regarded by experienced authorities as belonging to each kingdom; and one of the ablest of living naturalists, Ernst Haeckel of Jena, has proposed the division of the material

universe not into three but into four kingdoms—animals, plants, protista, and minerals, the new kingdom of Protista including the most lowly organised forms of what are generally considered animals and plants, from the Flagellate Infusoria to the Fungi, distinguished by the absence of sexes, and the mode of reproduction by gemmation or fission alone. The soundness of this new classification is not, however, admitted by the best remaining authorities in England or Germany.

One of the most obvious distinctions between the animal and vegetable kingdoms consists in the possession by the former of a power of voluntary motion of either the whole or a part of the body, dependent on the presence of a distinct nervous system, which is absent in the latter; a distinction obvious enough when contrasting any of the higher forms of the two kingdoms, but which, like all other individual characters, fails when pressed to too rigid a test. There are animals, so regarded by the best naturalists, and possessing other characters which compel us to refer them to this class, whose power of motion is confined to the "contractility" common to all protoplasmic substance, and which are absolutely devoid of a nervous system; and there are plants, unquestionable plants, which possess powers of spontaneous motion strictly comparable to those exhibited by the lower animals. It may be interesting to collect together a few illustrations of this last-named fact, some of which appear to the writer scarcely explicable by the application of any of those laws which govern inert unorganised matter.

The movements to which reference is here made belong in most cases to a part rather than to the whole of a plant; in some cases, however, we find the whole organism endowed with spontaneous motion of a very remarkable character. An instance of this occurs in the case of the regular undulating motion, exceedingly similar to that of some of the lower animals, characteristic of a class of Algæ hence called Oscillatoriæ. The mode of reproduction of the Algæ, the lowest class of the vegetable kingdom, to which the sea-weeds and the fresh-water confervæ belong, is often obscure, and in some cases different distinct processes exist in the same species. In certain freshwater Algæ, reproduction takes place by the formation of "Zoospores," which are the results of the separation and isolation of the protoplasmic contents of certain special cells. According to the observations of M. Thuret, who has paid great attention to this subject, these zoospores, which are of extreme minuteness, are ovoid in form, and are furnished, either over their whole circumference or towards

one extremity, with very fine cilia, varying from two to a large number. As soon as these minute bodies free themselves from the cell in which they are enclosed, the cilia begin to vibrate with great rapidity, the vibration being accompanied by a movement of rotation of the bodies themselves on their axis, occasioned apparently by rapid and spontaneous contractions; the result being a quick motion of the body through the water—undistinguishable, in fact, from that of some of the lower forms of animal life—continuing for a period varying from half an hour to several hours, at the expiration of which they settle down, reassume the characters of ordinary vegetable cells, lose their cilia, and give rise, by cell-division, to new individuals resembling the parent-plant. Those zoospores, which are furnished with cilia at one extremity only, direct that extremity, which is destitute of chlorophyll or green colouring matter, towards the light. Closely resembling these zoospores are the "spermatozoa" of the higher orders of cryptogamic plants, ferns, equisetums, and mosses. These bodies are produced in the antheridia or male organs, again by a modification of the protoplasmic cell-contents; they are filiform bodies of various forms, mostly presenting one or more spiral curves, and furnished with vibratile cilia. When released from the parent cells, they move about with great activity until they come into contact with the opening of the archegonium or female organ, which they enter, and thus fructify the germ of the new plant. Pringsheim describes the process by which the spermatozoa enter the archegonium as a very peculiar twisting motion, due to the action of the mucus or protoplasm of the germ-cell. He has seen a large number of spermatozoa enter a single cell, forming a kind of chain.

In describing these curious bodies, of the connection of which with the vegetable kingdom there is no room for doubt, one is irresistibly reminded of those lowly forms of animal life known as *Amœba* and *Gromia*, consisting apparently of shapeless masses of protoplasm, possessing indeed far more restricted powers of locomotion than the zoospores and spermatozoa, their faculties in this respect being confined to the protrusion and retractation of arms or pseudopodia, by means of which a slow movement is effected. If the possession of consciousness and of a voluntary control over the movements of the body belongs to the animal kingdom, even to its lowest forms, it is difficult to frame any cogent reason for denying these faculties to the vegetable organisms which we have been considering. A very interesting problem also presents itself for solution in the almost perfect identity of constitution

between these lowest forms of animals and the protoplasmic elements in the constitution of more highly organised forms. If the *Amœbæ* and *Gromiæ* are admitted to be distinct individual animals, the same line of reasoniug would almost compel us to admit to the same rank the white corpuscles of the blood of mammalia, which present almost the same characters and possess the same power of protrusion and retractation of a portion of their substance.

The instances above cited illustrate the faculty of spontaneous motion possessed by detached portions of protoplasm endowed with the power of forming themselves into new individuals. This phenomenon appears, however, to be but a form of the property possessed by all protoplasm of constant motion in some form or other. The circulation of the protoplasmic mucous fluid within the cells of plants is one of the most beautiful phenomena of vegetable life revealed by the microscope, and one of which the explanations at present offered appear quite inadequate. A favourite object for exhibiting this circulation or rotation is formed by the jointed hairs which cover the stamens of the Virginian Spider-wort (*Tradescantia virginica*). The movement is rendered visible by the presence in the otherwise colourless fluid of minute opaque granules of chlorophyll or other colouring matter; and is observable with great ease in the semi-transparent tissue of certain water-plants, as *Chara,* or the *Valisneria* commonly grown in fresh-water aquariums. It consists of a slow movement of the protoplasmic fluid up one side of the cell, across the ends, and down the other side ; not perpendicularly, but in an oblique or spiral course. The subject has been carefully investigated by three French physiologists, MM. Prillieux, Roze, and Brongniart, who find that the rotation is directly influenced in a remarkable manner by the presence of light. M. Prillieux kept a moss in the dark for several days, when the cells presented the appearance of a green network, between the meshes of which was a clear transparent ground. All the grains of chlorophyll were applied to the walls which separate the cells from one another; there were none on the upper or under walls which form the surfaces of the leaf. Under the influence of light, the grains, together with the thin mucous plasma in which they are imbedded, change their position from the lateral to the superficial walls, this change taking place, under favorable circumstances, in about a quarter of an hour. On attaining their new position, the grains do not remain absolutely immovable, but continually approach and recede from one another; and if again darkened, they leave their new position, and return

to the lateral walls. Artificial light produces the same effect as daylight.

Analogous to the circulation of the protoplasm within the cell is that of the sap or nutritive fluid through the whole plant, passing through the permeable walls of the cells. This circulation of the sap, by which fluid is conveyed equally to all parts of the plant, apparently in opposition to the laws of gravity, is, no doubt, explicable to a certain extent by the application of known physical laws, of which the most important are capillary attraction, osmose, or the law by which a less dense fluid passes through a permeable diaphragm to mingle with a denser fluid, and the upward pumping force to supply the partial vacuum occasioned by the evaporation of water from the leaves. Allowing, however, full scope to all these physical forces, there would seem to be a residuum of energy still unaccounted for connected with the vitality of the plant itself. In particular, the selective power of plants in absorbing from the soil a larger portion of those ingredients which are required for the formation or healthy life of their tissues, is an absolutely unexplained phenomenon. A familiar instance of this is furnished by the difference in the amount of silica absorbed by corn-crops and by leguminous plants, amounting in the former case to 2·5 per cent., in the latter to ·3 per cent. of the dry foliage. Indeed, if any two plants are grown together, side by side in the same soil, the constitution of the ash, that is, of the solid ingredients derived from the soil, will be remarkably different; while in the same plant in the same soil the constitution is constant. It was pointed out by the Duke of Argyll, when criticising Darwin's 'Origin of Species,' how unavoidable it seems, in describing the phenomena of nature, to use language involving the idea of contrivance and design. In the same manner it seems impossible to describe the process of vegetative life without appearing to attribute to the plant some conscious power of its own. A striking instance of this, as well as of the liability to consider a mere statement of an obscure law in other terms as an explanation of that law, occurs in an admirable treatise on the growth of plants—Johnson's 'How Crops Grow.'* "The cereals *are able to dispose* of silica by giving it a place in the cuticular cells; the leguminous crops, on the other hand, *cannot remove it* from their juices; the latter remain saturated, and thus further diffusion of silica from without becomes

* 'How Crops Grow;' A Treatise on the Chemical Compositions, Structure and Life, of the Plant, for Agricultural Students. By S. W. Johnson. Revised and adapted for English use by A. H. Church and W. T. T. Dyer. London: Macmillan & Co., 1869, pp. 345.

impossible, except as room is made by a new growth. It is in this way that we have a *rational and adequate* explanation of the selective power of the plant." The "rational and adequate explanation" seems to me, on the contrary, to be merely a restatement of this selective power of the tissues in other terms. Because the tissues want the silica, is no explanation of how they get it.

The curious and interesting movements of climbing plants have been investigated by Palm, Mohl, and Asa Gray, and form the subject of one of the most charming of Mr. Darwin's works. It is well known that climbing plants, such as the hop, honeysuckle, or major convolvulus, always twine round the stem or other object which supports them in one direction, that is, always either from right to left or from left to right; but few probably have reflected, and fewer still attempted to observe, by what process the end of the growing shoot contrives to change its position from one side to the other of the stem. If the extremity of a living stem, say of convolvulus, growing perfectly free and in a normal position, is observed, it is seen to hang over from its support in a horizontal direction; and this horizontal portion is found, if observed at intervals of some hours, to point in different directions. The end of the growing shoot has, in fact, the property of revolving in a large circle round the support, always with the same species in the same direction, either with the sun or opposed to the sun. The rate of revolution varies with different plants, and with the same plant at different periods of its growth; it is much quicker in warmer than in cooler weather. With the hop Darwin found it to vary from two and a half hours to nine hours. The object of the climbing power of plants is, no doubt, to reach the light and to expose a large surface of leaves to its action and to that of the free air; but the mode by which this power of motion is gained is by no means clear. The late eminent physiologist Mohl supposed that it was caused by a dull kind of irritability in the stem, which caused it to bend towards the support when in contact with it. Mr. Darwin has, however, carefully tested this theory experimentally, and always with negative results. He rubbed many shoots much harder than was necessary to excite movement in any tendril or in any foot-stalk of a leaf-climber, but without result. This view seems also entirely negatived by the fact that not only do the stems of climbing plants revolve when they are not in contact with any support, but even more freely under such circumstances than when climbing. When a climbing plant first springs from the ground, the extremity of the shoot performs slow gyrations in

the air, as if, as Darwin expresses it, it were *searching* for a support. I do not here discuss the question whether this habit may be the result of a tendency transmitted and enhanced through thousands of generations; the movement itself is, in the individual plant, entirely "spontaneous" in every sense of the term; that is, is not the necessary result of known physical laws acting upon the individual. Darwin's paper "On the Movements and Habits of Climbing Plants," published in the 'Journal of the Linnean Society,' contains a number of the most interesting observations on this class of plants; and the language employed is everywhere suggestive of some hidden sentient controlling power in the plant itself.

The same purpose as that served by a climbing stem is answered in other plants, as the vine, Virginian creeper, and passion-flower, by tendrils; and the phenomena of spontaneous motion in tendrils are, if possible, still more curious. Some tendrils display the same power of rotatory motion possessed by the extremities of the shoots of climbing plants, others do not revolve, but are sensitive, bending to the touch. The curling movement consequent on a single touch continues to increase for a considerable time, then ceases; after a few hours the tendril uncurls itself, and is again ready for action. A tendril will thus show a tendency to curl round any object with which it comes into contact, with the singular exception that it will seldom twine itself round another tendril of the same plant. It is also very curious that with some exceedingly sensitive plants, the falling of drops of rain on the tendril will produce no effect whatever. The mode in which a tendril of a *Bignonia* catches hold of a support is thus described by Darwin:—"The main petiole is sensitive to contact with any object; even a small loop of thread after two days caused one to bend upwards. The whole tendrils are likewise sensitive to contact. Hence, when a shoot grows through branched twigs, its revolving movement soon brings the tendril into contact with some twig, and then all three 'toes' bend (or sometimes one alone), and, after several hours, seize fast hold of the twig, exactly like a bird when perched." The Virginian creeper has another mode of attaching itself to a wall or other solid support, by the formation at the extremities of the branches of the tendril, of little disks or cushions, very similar to the disks on the foot of the house-fly by which it is enabled to attach itself to our windows and to walk along the ceiling. These disks secrete a glutinous fluid which attaches the tendril to the support with such strength that it is often impossible to detach it without destroying the tendril or even removing a portion of

the wall itself. As soon as the attachment is accomplished the tendril gradually thickens and contracts spirally. This spiral contraction, indeed, is always the result of the tendril meeting with a support; and if no support is found, the tendril soon shrinks and withers away. Some tendrils exhibit a most remarkable power of selection, which, to use Mr. Darwin's words, "would, in an animal, be called instinct." The tendrils of a species of *Bignonia* slowly travelled over the surface of a piece of wood, and when the apex of one of them came to a hole or fissure, it inserted itself; the same tendril would frequently withdraw from one hole and insert its point into a second one. Mr. Darwin has seen a tendril keep its point, in one instance for twenty hours, and in another instance for thirty-six hours, in a minute hole, and then withdraw it. After the record of this fact on such unexceptional evidence, we are the more prepared to credit the statement of Mr. Anderson-Henry that a climber will, in running up a wall, carefully avoid contact with another climber which it dislikes; and even the account by M. Paul Lévy* that the *lianes* of tropical forests have an affinity for certain trees, towards which they direct their growth, and not towards those nearest to them; carefully drawing themselves away when they encounter one of the objectionable trees.

We may conclude our account of climbing plants with the following remarks by Mr. Darwin:—"It has often been vaguely asserted that plants are distinguished from animals by not having the power of movement. It should rather be said that plants acquire and display this power only when it is of some advantage to them; but that this is of comparatively rare occurrence, as they are affixed to the ground and food is brought to them by the wind and rain. We see how high in the scale of organisation a plant may rise, when we look at one of the more perfect tendril-bearers. It first places its tendrils ready for action, *as a polypus places its tentacula*. If the tendril be displaced, it is acted on by the force of gravity, and rights itself. It is acted on by the light, and bends towards or from it, or disregards it, whichever may be most advantageous. During several days the tendrils or internodes, or both, spontaneously revolve with a steady motion. The tendril strikes some object, and quickly curls round, and firmly grasps it. In the course of some hours it contracts into a spire, dragging up the stem, and forming an excellent spring. All movements now cease. By growth, the tissues

* 'Bulletin de la Société Botanique de France.' Translated in the 'Gardener's Chronicle,' March 19, 1870.

become wonderfully strong and durable. The tendril has done its work, and done it in an admirable manner."

The phenomenon known as Sensitiveness is of by no means uncommon occurrence in the vegetable kingdom. It consists of a sudden movement of the leaf, a portion of the flower, or the whole plant, on contact with, or even on the approach of, a foreign body. One of the most familiar examples is that of the Sensitive Plant, *Mimosa pudica* and *sensitiva*, in which three distinct movements are observable when the leaf is touched by the hand or the warm breath. First, the numerous leaflets close in pairs, bringing their upper faces together, and also inclining forwards; then the four branches of the leaf-stalk, which were outspread like the rays of a fan, approach each other; at the same time the main leaf-stalk turns downwards, bending at its joint with the stem. The explanation offered in one of our best botanical text-books of this phenomenon is as follows:—"There is a swelling at the base of the petiole, the cells of which constitute, as it were, two springs acting in contrary directions, so that if the one from any cause be paralysed, the other pushes the leaf in the direction of least resistance. These springs, if they be so called, are set in action by the rush of fluid creating a turgid state of the one set of cells and an empty state of the other. What circumstances regulate the turgescence are only imperfectly known." It will be obvious that even if this is correct as a statement of facts, it offers no real explanation of the phenomenon; for it is quite as difficult to understand how the mere approach of the hand, which gives rise to a sensitiveness commencing, it will be remarked, at the *extremity* of the leaf, will account for a "turgescence" of the springs at the *base* of the leaf, which then causes the movement. It should be observed also that we are unaware of any use which these movements are to the plant. Similar sensitiveness occurs in the leaves of some other leguminous plants, in several species of *Oxalis*, &c. M. Bert has observed that the sensitiveness is destroyed by the continual application of chloroform, and also by placing the plant constantly in the dark or in green light.

Similar movements to that of the Sensitive Plant, but occurring spontaneously, may be observed in other plants. Thus, in the *Desmodium gyrans*, or "Telegraph Plant," sometimes grown in our hot-houses, belonging to the same order, Leguminosæ, the leaf consists of three leaflets, a large central, and two smaller side ones. The motion is especially observable in the small side leaflets, which on a warm summer's day may be seen to rise and fall by a succession of

jerking movements; now stopping for some time, then moving briskly, always resting for a while in some part of their course, and starting again without apparent cause, "seemingly of their own will," as Prof. Asa Gray remarks. The movement is not simply up and down, but the end of the moving leaflet sweeps more or less of a circuit. It is not set in motion by a touch, but begins, goes on, and stops, of itself.

An exceedingly remarkable instance of sensitiveness occurs in the case of the "Venus's Fly-trap" of North Carolina, *Dionœa muscipula*. In this plant the mid-rib of each leaf serves as a kind of hinge. When the inside of the blade of the leaf, or the fine bristles which grow on its surface, are touched by any foreign substance, the hinge suddenly closes, and if the intruding substance be a fly or other small object, it is immediately imprisoned as represented in the figure, the teeth on the margin of the leaf closing firmly upon one another like a steel trap, the sides of the trap then flatten down and press firmly upon the victim, and it now requires a very considerable force to open the trap. If nothing is caught the trap presently reopens of itself, and is ready for another attempt. With regard to the object of this strange proceeding, there can be no doubt that the insect is retained until the softer parts of the body are completely dissolved in the thick mucous fluid which is exuded by the leaves; and Professor Asa Gray considers that the evidence is nearly complete that the animal matter is actually absorbed in the leaf itself. It is even stated that pieces of raw beef are digested by the leaf in the same manner! Seeing, however, that it is now generally admitted by physiologists that even pure water is not absorbed through the pores of leaves, which serve only for the *exhalation* of vapour, this explanation is very hard of belief. The "pitchers" of the *Nepenthes*, or pitcher-plant, act also as fly-traps, large numbers of insects being enticed into them by the fluid they secrete, and are then unable to extricate themselves.

The sensitiveness of the leaves of plants is but an excessive development of the phenomenon known as the Sleep of Plants. In the case of the Sensitive Plant the position assumed by the leaf and leaflets in the night is the same as that which they assume when disturbed in the day-time; and with many other plants, such as the clover and the *Robinia* or "acacia" tree, the change in the position of the leaflets, morning and evening, is a familiar fact. The Sleep of Plants extends also to the flowers, many plants opening their flowers only at particular times of the day. Thus, the major convolvulus of

the gardens and the goat's-beard open at sunrise and always close by about noon, the evening primrose opens only in the evening, and many others last for but a single day. So regular is the time of opening and closing of some flowers, that Linnæus drew up a list, which he termed a "floral clock." The singular part of the affair is, that with many flowers the time of opening and closing is determined, not by the degree of light, or by the temperature or humidity of the atmosphere, but absolutely by the hour of the day. The giant water-lily of the Amazons, the *Victoria regia*, opens, for the first time, about 6 p.m., and closes in a few hours, then opens again at 6 a.m. the next day, remaining open until the afternoon, when it closes and sinks below the water. Other plants, again, open their flowers only in the bright sunshine, as the beautiful yellow centaury or *Chlora perfoliata*, the sundew, *Drosera rotundifolia*, &c. In the latter plant, belonging to the same natural order as the Venus's Fly-trap, and possessing a slight irritability of the leaves, Mr. Worthington Smith has noticed also a strong sensitiveness in the petals, the flowers closing suddenly when touched.

Irritability or sensitiveness, similar to that of the leaves of the Sensitive Plant, is not uncommon in the flower. An instance has been alluded to in the petals of the sundew; it occurs also in the lip of the corolla of several of the orchis tribe. It is, however, more common in the proper organs of reproduction, as the style of *Stylidium*, the stamens of the berberry, &c., and is then directly connected with the process of fertilisation of the ovule. In *Stylidium*, an Australian genus, the style and filaments are adherent into a column, which hangs over on one side of the flower. When touched, it rises up and springs over to the opposite side, at the same time opening its anthers and scattering the pollen. The stamens of the various species of *Berberis* and *Mahonia*, to the former of which our common berberry belongs, exhibit this irritability to a remarkable degree. If touched with a pin or other object at the base of the inside face of the filament, the stamen will spring violently forward from its place within the petal, so as to bring the anther into contact with the stigma, and after a time slowly resume its original position. At first sight it may seem as if this contrivance were intended to ensure the fertilisation of the pistil from the pollen of its own flower. In reality, however, the reverse is the case; the excitation takes place in nature when an insect entering the flower for the sake of the honey in the glands at the base of the pistil, touches the inside of one of the

stamens. The pollen is thus thrown on to the head or body of the insect, which carries it away to the next flower it visits, and leaves some of it on the stigma, and thus cross-fertilisation instead of self-fertilisation is secured. Similar motion of the stamens towards the pistil, but spontaneous, takes place in the case of the London Pride, and other species of *Saxifraga*.

Elasticity is, indeed, a common property of organised tissue, though it is not often developed to so evident an extent. In the "touch-me-not," or *Impatiens*, we have a familiar instance in the seed-vessel, which, if touched when nearly ripe, suddenly coils back, throwing the seeds to a considerable distance. The "squirting cucumber" (*Momordica Elaterium*) marks the period of ripeness by the fruit separating from its stalk, and expelling the seeds and juice with great violence. Mr. Thomas Meehan described a remarkable instance of elasticity at a recent meeting of the Academy of Natural Sciences of Philadelphia. The seeds—or, as would appear from his description, more correctly the embryos of the seeds—of the American "witch-hazel" (*Hamamelis virginica*) are thrown out with such force as to strike people violently in the face who pass through the woods. Collecting a number of the capsules, and laying them on the floor, he found the seeds or embryos were thrown out generally to the distance of four or six feet, and in one instance as much as twelve feet.

Many of the instances of spontaneous motion or irritability we have now recorded may doubtless be explained by the application of known physical laws. With others this is not so easy; and it is but reasoning in a circle to say that, because the organisms which manifest them belong to the vegetable kingdom, therefore the phenomena cannot be the result of a sentient force acting upon, and independent of, matter. Darwin has described how certain movements of the tendrils of climbing plants would be termed instinctive if they were observed in animals. The rapid rotatory motion of the zoospores of the lower Algæ is absolutely undistinguishable from that of certain undoubted lowly organised forms of animal life. It is very difficult to distinguish between the movement of a shoot of a climber performing its circles in the air in search of a support, and that of the tentacula of a coral-polyp in search of food. The mode in which the Venus's Fly-trap seizes and encages its prey is very like that adopted by a sea-anemone. Every fresh addition to our knowledge seems to confirm us in the view that it is unwise to dogmatise by laying down too rigid generalities, and absolutely to deny certain functions to whole classes of

animated beings because we do not find them exhibited in the forms most familiar to us. I do not wish distinctly to claim for plants the actual possession of a voluntary or sentient faculty. But I do wish to point out that facts do not support us in asserting that a clear line of demarcation separates the animal from the vegetable kingdom; the power of voluntary motion belonging to the one and not to the other. Taking all the facts we have described into consideration, the statement seems justified which has been made by one of our most experienced naturalists, Professor Wyville Thomson*: —"There are certain phenomena, even among the higher plants, which it is very difficult to explain without admitting some low form of a general harmonising and regulating function, comparable to such an obscure manifestation of reflex nervous action as we have in sponges and other animals in which a distinct nervous system is absent."†—*Popular Science Review.*

FORMATION OF HIPPURIC ACID IN THE URINE OF HERBIVORA.

By Hofmeister.

Sheep fed on clover-hay secreted as an average 5·3 grams only of hippuric acid in twenty-four hours, but when fed on meadow-hay an almost constant quantity of thirty grams. The addition of benzoic acid to the clover-hay gave rise to an increase in hippuric acid of rather more than the calculated weight, showing that clover does not in itself prevent the formation. The distillate and watery extract obtained on distilling meadow-hay with water, dried and given to sheep, produced no increase in hippuric acid, but the dried residue caused its secretion in almost the same proportion as the original hay.

* "Introductory Lecture to the Natural History Class at the University of Edinburgh," May, 1871. See 'Nature,' vol. iv, p. 91.

† Since writing the above, I have met with the following remarks by the Italian botanist, Prof. Delphino ('American Naturalist,' July, 1871, p. 297):—"I must here, as always, declare myself a teleologist and a vitalist. Now, teleology and vitalism, far from being vanquished by the Darwinian doctrine, find in it their most solid support. What do teleology and vitalism mean? They mean that we believe that there is in all living things an innate, specific principle, intelligent, free, and teleological. This principle is the hidden cause of the variability of organised beings, as well as the wonderful harmonies which have been established between one being and another."

Meadow-hay was then exhausted consecutively with water, alcohol, and three per cent. soda-ley. The alcoholic extract produced a slight increase in hippuric acid; the watery and alkaline extracts and the residue had no appreciable effect. The non-formation of hippuric acid from this residue is in opposition to the observations of Meissner, who from experiments on rabbits arrived at the conclusion that the formation of this acid was due to the digestion of some substance contained in the crude fibre, probably the cuticular membrane. That the nitrogenous constituents of the food do not wholly regulate the secretion of the acid is proved by the facts that the addition of rape cake to the food had no action on its quantity, but only increases the urea, and that a much smaller quantity is formed by feeding with clover than with graminaceous plants.

Neither do the aromatic substances of the food seem to have much influence: for the alcoholic extract of meadow-hay, containing the greater part of the aromatic bodies, produced but a small quantity of hippuric acid, and Henneberg and Stohman found as much in the urine of oxen when fed on oat-straw as when eating meadow-hay.

By gradually increasing the quantity of oat-straw given in combination with clover-hay, the hippuric acid secretion in the urine of sheep was gradually increased; in a similar experiment with barley-straw no such increase took place.

Notwithstanding contradictory appearances, the author still thinks that the secretion of hippuric acid is influenced by the protein matters and the fibre of the food, though the conditions necessary can only be found by a closer examination of these substances.—*Versuchs-Stationen Organ.*

GASTRIC JUICE AND PEPSIN APPLIED TO WOUNDS.

The *New York Medical Journal* states that there have been performed recently a number of experiments with the above fluids, applied as follows:—The gastric juice of dogs was pencilled, at short intervals daily, fifteen to twenty minutes upon the wounded surface, or small pledgets of cotton were applied, and upon them a second larger layer of wadding dipped in a very dilute solution of muriatic acid. Several experiments were made, especially upon chancres, upon soft chancres in particular. After five to eleven days, commencing cicatrization followed as a rule. The remedy is chiefly indi-

cated in soft chancre, in diphtheria, phagedæna, and noscomial gangrene.—*Popular Science Review.*

COMPOSITION OF SOME FOOD STUFFS.

By H. Weiske-Proskau.

The author examined the rank herbage which grows in patches on meadow land where manure has fallen, and which cattle eat with reluctance. Compared with the surrounding herbage, it was found to contain twice as much nitrogen, and rather more woody fibre and ash. The ash was much richer in soda and magnesia, and also contained rather more potash and sulphuric acid.

The percentage composition of other food stuffs examined was as under:

	Buckwheat grain.			Vetches grain.			Hay.					Green oats and vetches.
	Ordinary.	Scotch.	Partarian.	Ordinary.	White.	Grey.	French rye-grass.	Sainfoin.	Hop-trefoil.	White clover.	Bokharian clover.	
Water	9·57	10·57	10·62	12·93	13·68	14·36	8·15	11·77	11·84	9·82	12·00	81·50
Albuminoids .	10·75	10·69	11·19	27·50	27·81	29·06	7·31	15·44	17·78	17·00	14·03	3·39
Soluble carbohydrates and fat	61·39	61·10	53·58	47·80	48·03	46·72	42·46	36·24	37·69	44·90	31·55	6·61
Crude fibre ...	15·55	14·96	20·01	7·17	6·87	6·22	33·99	30·86	25·16	18·83	37·00	6·36
Ash	2·74	2·68	4·60	4·60	3·61	3·64	8·09	5·69	7·53	9·45	5·42	2·14

The hay examined was harvested at the commencement of blossoming.—*Ann. d. Landw. Wochen-Blatt.*

FORMATION OF UREA IN THE ORGANISM.

By O. Schultzen and M. Nencki.

It has been supposed by many chemists that albumin contains the complex of atoms of urea, and that the latter substance is a direct product of the gradual oxidation of the former. All attempts to produce urea by oxidation of albumin have failed, the products obtained by using oxidising agents being ammonia, benzoic acid, benzaldehyde, and aldehydes of the fatty series, while those got by the use of acids and

alkalis are ammonia and amido-acids of the fatty and aromatic series (glycocine, leucine, and tyrosine). These three bodies, leucine, tyrosine, and glycocine, constantly occur in the animal body under normal conditions. Glycocine can be removed from the body in considerable quantities by the administration of benzoic acid, and leucine and tyrosine occur in pleuritic or ascitic exudations. Whenever albumin decomposes and oxidation is hindered by the absence of hæmoglobin, as is the case in pus, much leucine and tyrosine are found, but little or no urea; and when the oxidising power of the organism is diminished, as in acute atrophy of the liver and in phosphorus poisoning, much leucine and tyrosine occur in the urine, but scarcely any urea. These circumstances led the authors to believe that the amido-acids of the fatty series, and perhaps tyrosine, were the intermediate links between albumin and urea. In order to test this hypothesis, they fed dogs on a diet containing a constant but small amount of nitrogen, and thus got a constant and small amount of nitrogen in the urine. They then gave the animals a quantity of leucine, tyrosine, or glycocine, in order to see if the amount of urea in the urine was increased, as it must be if these substances are transformed into it in the body. The result was, that after the administration of leucine or glycocine, the amount of urea in the urine was greatly increased and the nitrogen contained in the additional urea very nearly corresponded with that of the glycocine and leucine, clearly showing that these bodies are converted into urea. The urea was also increased by tyrosine, but not to so great an extent, and part of the tyrosine appeared unchanged in the urine and fæces. The authors therefore think that the greater part of the tyrosine is absorbed from the intestine, but is destroyed so slowly in the body that a part of it is excreted unchanged in the urine, while that portion which does undergo transformation is excreted as urea. When acetamide was given to the dogs, it was excreted unchanged, and no part of it was converted into urea. As amido-compounds analogous to acetamide are not excreted normally in the urine, the authors think that they are not formed during the decomposition of albumin in the body. Since amido-acids contain only one atom of nitrogen and urea contains two, it must be formed from them by synthesis, and the authors think it likely that bodies from the cyanogen group form the intermediate links.

According to their idea, the albuminous substances contained in food take up water under the influence of the digestive ferments and are split up partly in the alimentary

canal, but chiefly in the circulation, into amido-acids and non-nitrogenous bodies. The latter undergo combustion and yield carbonic acid and water, while the amido-acids form urea. They think it not improbable that ammonia is liberated from albumin simultaneously with cyanic acid, and unites with it to form urea, or with cyanogen to form cyanamide, which is then transformed into urea.

The urea in their experiments was determined by Bunsen's method, which the authors have improved. For details the original paper must be consulted. Liebig's method did not answer, an acetamide precipitated the murcuric nitrate as well as urea.—*Zeitsch. f. Biologie.*

THE INORGANIC CONSTITUENTS OF THE BLOOD.

By A. Jarisch.

Jarisch has made (in Stricker's laboratory at Vienna) analyses of the inorganic constituents of dogs' blood with more than ordinary care and precautions. The blood was received direct from the vessel in carefully weighed and stoppered flasks surrounded by ice in order to avoid loss by evaporation. The weight was accurately determined after the blood had been allowed to thaw. The blood was then carefully evaporated, and the mass, before complete incineration, digested with hot water in order to extract soluble chlorides, &c., and thus provide against loss of these constituents by strong heat. The solution was evaporated, incinerated to destroy organic matters, and redissolved in water. This solution was added to the fully incinerated mass, and the whole evaporated and dried. In this manner the inorganic constituents were obtained without loss. As, however, even after the most careful incineration, it is almost impossible to get rid of all the carbon, the results are always a little too high, but serious error is eliminated by comparison of the found with the calculated constituents.

The ash so obtained is partly soluble in water, and completely so in hydrochloric acid. The watery solution has an alkaline reaction. The alkaline reaction is neutralised by a drop or two of dilute acid, and the ash probably consists of neutral salts and iron oxide. The method of quantitative determination is fully given in the original paper.

Tables are given of the results of four analyses, three of arterial and one of venous blood. The percentage amounts

are compared with those given by Verdeil. There is a general agreement in many points, but Jarisch finds no carbonic acid, and his percentages of soda and potash differ considerably from those given by Verdeil. The following is the mean percentage of the various constituents calculated from four analyses:

Phosphoric anhydride	0·1103
Sulphuric anhydride	0·0358
Chlorine	0·2805
Potash	0·0342
Soda	0·3748
Lime	0·0112
Magnesia	0·0058
Iron oxide	0·0948

Calculated total, 0·8640; found, 0·8922.

—*Ann. Chem. Pharm.*

THE CHEMISTRY OF THE SECRETIONS.

Under the title of "The Chemical Modifications which the Secretions undergo under the Influence of some Agents which modify the Blood-Globule," M. Ritter has written a thesis for the Doctorate of Sciences of Paris, which is abstracted in the *Revue des Cours Scientifiques*, and which furnishes an important contribution to the history of the secretions. He has sought to determine the influence exercised on the composition of the secretions, and especially of the urine, by various agents—oxygen, protoxide of nitrogen, oxide of carbon, antimonials, arsenical salts, phosphorus, and the sodic salts of the acids of the bile. Omitting the details of his experiments, the following are his principal results.

Inhalations of oxygen ought evidently to accelerate organic combustion, and consequently to augment the quantity of the products of advanced combustion contained in the urine. The experiments of M. Ritter accordingly demonstrate that in these cases the urine is more acid; it contains more ammoniacal salts; the proportion of urea to uric acid augments; but, on the other hand, the quantity of urea, as well as the total quantity of nitrogen, eliminated by the urine, diminishes. There is here a contradiction—apparent, at least—between facts and theory. But may not the urea itself be burnt also? May it not be transformed into water, carbonic acid, and nitrogen, which are eliminated by the respiratory organs? And, in fact, Allen and Pepys, Regnault and Reiset, have

ascertained an increase of nitrogen in the gases expired by an animal which breathes pure oxygen. The greater acidity of the urine is due to the presence of an organic acid in more than the normal quantity. M. Ritter believes this to be lactic acid, which is known to be a product of the oxidation of nitrogenous substances.

Muscular activity acts nearly in the same way as the inhalation of oxygen. Byasson had already determined that it augmented the urea, uric acid, and chlorides; whilst brain-work augmented the urea in a more marked degree, as well as the sulphates and phosphates. M. Ritter is not completely in accordance with that author. His researches have borne upon the influence of walking exercise, the brain-work remaining the same. Oxidation is increased, but in a mode differing according to circumstances. A moderate walk by an individual rising from complete rest is followed by an increase of the quantity of nitrogen eliminated by the urine; the proportion of urea to uric acid increases by nearly one half. If the individual be already leading an active life, the products of oxidation are slightly increased, but in an almost identical proportion. If the individual make a forced march, the total quantity of azote diminishes; but the relation of the urea to the uric acid increases, as after the inhalation of pure oxygen.

Before determining the action of protoxide of nitrogen on the urine, M. Ritter investigates that which it exercises on the blood; and he shows that this gas is dissolved in the blood in greater quantity than in serum deprived of blood-corpuscles; but that all the gases, even carbonic acid and hydrogen, displace it easily, whilst it only displaces these gases incompletely and at the end of a very long time. At the same time, in a long series of experiments, M. Ritter proves that the oxidising action of the gas, at the temperature of the human body, is not comparable to that of atmospheric air. Whether, then, protoxide of nitrogen be breathed, or water charged with the gas be drunk, it is found that the quantity of carbonic acid expired is always diminished; that, in the urine, the quantities of urea, uric acid, nitrogenous matters, are increased, but in a degree proportionate to the quantity of the urine itself, which is also augmented. There is a diuresis here, which must probably be referred to a special physiological action of the protoxide of nitrogen.

The admirable researches of Claude Bernard have taught us that the oxide of carbon deprives the blood-corpuscles of their faculty of absorbing oxygen. This gas, then, ought, *à*

priori, to arrest oxidation; and, in fact, if an animal be submitted to the inhalation of oxide of carbon in non-poisonous doses, a diminution is observed of the products, which may be regarded as affording a measure of the intensity of the oxidation, diminution of the urea, of the total nitrogen, and especially a diminution in the proportion of the urea to the total nitrogen.

M. Ritter has studied three bodies which resemble each other very much in their action, and which are, in the order of their energy, antimony, arsenic, and phosphorus. The compounds of these metalloids, introduced into the organism, lead to a diminution of the quantity of urea and of the total quantity of nitrogen, and an augmentation of the quantity of uric acid. The urine is alkaline. Taken in stronger doses, they lead to changes in the blood—dissolution of the corpuscles, and the presence of crystals of hæmoglobine. In these cases, the urine contains albumen, colouring matters of the bile, &c.; it is profoundly changed. If the dose be less strong, there is found in the blood, and in the whole organism, an increase of fat and of cholesterine. They are, then, agents of deoxidation.

As to the acids of the bile, M. Ritter has found that taurocholate of soda, injected directly into the blood, has an action analogous to that of phosphorus, but more energetic.

A criticism is suggested by the perusal of this interesting monograph on the action of various agents on the composition of the urine. Are these changes necessarily consecutive to the changes of the blood-corpuscle? M. Ritter affirms it by the title of his thesis. The oxide of carbon acts on the globule; antimony, arsenic, and phosphorus, do so when they are administered in strong doses; but, in the other cases reviewed, it has not been proved that alteration of the corpuscle takes place. It is probable, but not yet demonstrated.—*British Medical Journal.*

INFLUENCE OF NERVES ON NUTRITION.

Various contributions have been made in reference to this physiological question since we last referred to the subject in connection with the researches of Sinitzin (Journal, vol. i, 1871, p. 535). Fischer (*Berlin. Klin. Wochenschr.*, 1871, No. 13) and Schifferdecker (*Berlin. Klin. Wochenschr.*, 1871, No. 14) have described very minutely the abnormalities of

nutrition and the destructive changes which follow lesions to the nerves of the extremities. Both these observers regard the nutrition of the tissues as regulated by a distinct system of trophic nerves apart from the purely vaso-motor nerves.

Bearing on this subject, also, are the important observations of Goltz in regard to the influence exerted by the nervous system on absorption (Pfluger's *Archiv*, v, p. 53). These researches have already been referred to in this Journal (June 15th, 1872, p. 644), in connection with the pathology of œdema. Goltz looks upon the capillary system as a huge gland under the influence of a system of nerves which regulates the amount of absorption and transudation of fluids in a manner distinct from the mere amount of contraction and dilatation of the vessels. such as we should attribute to purely vaso-motor action. The whole vascular area would in such case resemble the secreting glands, influenced by a system of secretory nerves apparently independent of mere changes in the circulation. Dr. Joseph (*Centralblatt*, No. 46, 1871) likewise investigates the question of trophic nerves as regards the limbs of frogs. He denies altogether the existence of such nerves, and regards the changes which ensue as due to functional inactivity. It is questionable, however, how far these purely negative results obtained by Joseph are to weigh against the numerous cases which have been frequently observed, in which positive results followed, apparently not capable of such a simple explanation. M. Vulpian (*Comptes Rendus*, lxx, No. 15) has investigated more particularly the influence of the nerve-centres on the nutrition and contractility of muscular tissue. After section of motor nerves, in addition to the histopathic changes in the nerves themselves, atrophy of the muscles to which they are distributed ensues; and, after section of mixed nerves, the electric muscular contractility undergoes rapid diminution. Vulpian endeavours to determine whether these changes in muscle are due to lesions of motor, sensory, or sympathetic (vaso-motor or other) fibres, of which the nerve may be composed. He had already observed that atrophy of the tongue resulted from section of the hypoglossal, but not from section of the lingualis. As it might be objected that the atrophy in this case was due not merely to the division of motor filaments, but of others, such as sensory, which may be contained in the hypoglossal, he investigates the changes in muscle which follow section of the facial nerve, in which there do not seem to be any sensory or sympathetic filaments. He finds that the nerve itself suffers degeneration; and the same changes take place in the facial muscles as are observed in the muscles of the ex-

tremities after section of their respective nerves. He therefore attributes the atrophic degeneration to the section of the motor nerves, which he regards as the trophic nerves of the muscles. He denies that mere functional inactivity is able to account for these changes, inasmuch as the nutrition and irritability of muscles may remain intact in numerous cases of hemiplegia and paraplegia, where functional activity is complete. He likewise excludes the supposition that the degeneration of the muscle is the consequence of a propagation of the irritation caused by section of the nerve to the muscle, because the rapidity and intensity of the degeneration of the muscle stand in no corresponding relation to the changes which take place in the nerve. He also endeavours to show that the degeneration is not due to any changes in the vessels. On this point, however, he merely shows that the walls of the vessels remain unaltered. He concludes, from his observations, that the trophic centre of the muscles is in the central nervous system. In support of this he adduces the muscular atrophy which results from degeneration of the anterior horns of the spinal cord. He looks on the gray matter of the cord, and the medulla oblongata and its corresponding parts in the pons, as the true trophic centres, which exert their influence on the muscles directly through the motor nerves themselves; and in this way he explains the degenerations which result when the motor nerves are cut by the cessation of the influence of the trophic centres.—*The British Medical Journal.*

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF THE COUNCIL, HELD OCTOBER 2ND.

M. J. HARPLEY, Esq. (President), in the chair.

Present:—Professors Simonds, Brown, Pritchard, and Williams; Messrs. Balls, Broad, J. C. Broad, Burrell, Cartledge, Cartwright, Cox, Dray, Colonel Fitzwygram, Field, Fleming, Gowing, Greaves, Hunt, Lowe, Mayer, Moon, Naylor, Owles, Pritchard, Silvester, Wilkinson, and the Secretary.

The minutes of the previous meeting having been read,

Mr. Wilkinson inquired if Professor Williams intended his motion, of which he had given notice, to apply to any other College besides Edinburgh.

Professor Williams stated that it was intended to apply generally to the students of all the colleges.

The minutes were then confirmed.

A Report of the Veterinary Department, presented by Dr. Alexander Williams, Secretary, to the Library of the College, was laid on the table.

Also a copy of Professor Williams' new work, entitled, 'The Principles and Practice of Veterinary Surgery,' presented by the author.

On the motion of *Mr. Wilkinson*, seconded by *Mr. T. C. Broad*, the thanks of the Council were accorded to Dr. A. Williams and to Professor Williams.

A letter was read from Professor Flower, acknowledging his election as an examiner.

Letter read from Professor Brown, tendering his resignation as an active member of the Examining Board in consequence of his appointment as Professor of Physiology at the Royal Veterinary College.

Mr. Wilkinson, in moving that Professor Brown's resignation be accepted, said he did it with the utmost regret. If there was a gentleman in their profession able to fill that chair at the Examination Board it was Professor Brown; and as far as he was concerned as a brother examiner, he should very much regret the loss of his services to the Board generally.

Mr. Dray seconded the motion, which was agreed to.

Mr. Wilkinson next proposed Mr. Fleming as a successor to Professor Brown. They all knew the zeal that Mr. Fleming could bring to bear upon any subject he took in hand. They also knew his immense industry and his determination to accomplish whatever he took up. He would in every way be a very eligible successor to Professor Brown.

Mr. Mayer seconded the proposition, which was supported by *Professor Williams*, and unanimously agreed to.

Mr. Fleming said, in accepting the office which they honoured him by imposing upon him, he did so with a very large amount of diffidence, and that amount of diffidence was largely due to the position of the gentleman he was about to succeed. The high reputation which Mr. Brown enjoyed as a scientific gentleman of their profession, and the high praise that had been lavished upon him as an examiner, made it a very severe task indeed for any one to follow him. However, his diffidence and bashfulness were very largely compensated for by a strong determination to do justice to the profession whose interests he had so much at heart.

The Examinations.

The Council then proceeded to the notice of motion given by Professor Williams.

The following is the petition to which the motion refers:—

To the President and Council of the Royal College of Veterinary Surgeons.

NOTICE OF MOTION.

That I shall move at the next succeeding Quarterly Meeting, "That the prayer of the Petition, from the Professors of the Veterinary College, Edinburgh, be granted."

W. Williams,
Member of Council.

Petition from the Principal and Professors of the Edinburgh Veterinary College to the President and Council of the Royal College of Veterinary Surgeons.

Whereas it has always been the custom up to this date to examine the Veterinary Students after the completion of two Winter Sessions of attendance at the Edinburgh Veterinary College, in all the subjects necessary to the procuring of your Diploma, at one and the same time, we, the undersigned, respectfully recommend, in the interest of the Teachers, the Students, and the Profession, that the Examination in future be more assimilated to the mode of conducting the Medical Examination, that is, the various subjects ought to be divided into two distinct sets, in which the Candidates shall be thoroughly tested, and with this view beg to submit for your favorable consideration and approval the following Rules and Regulations.

I. There shall be Two Examinations held yearly, viz. one in July and one in April.

II. Candidates who have attended at least one Winter Session of the Veterinary College shall be allowed to present themselves for examination on Anatomy. Chemistry, and Materia Medica, nine months, but not earlier, after the commencement of their professional studies.

III. The above shall be called the First or Minor Examination.

IV. Candidates who have passed the First Examination, and who have attended the Curriculum of the Veterinary College at least two Winter Sessions, shall be allowed to present themselves for the Second or Final Examination, which shall consist of Histology and Physiology, Cattle Pathology, Horse Pathology, and Clinical Medicine.

V. Candidates failing to pass any of the Examinations shall be required to attend the Veterinary College for a period of not less than three months before being allowed to present themselves for Re-examination.

VI. Every Candidate must pass the First Examination before being tested on the subjects of the Second Examination.

VII. The above Rules and Regulations shall apply only to Students who commence their Professional Studies for the first time on or after November, 1872.

Should the above suggestions be adopted, we feel confident they will be giving the Student an opportunity of utilising his time in acquiring a thorough knowledge of the individual studies which it is necessary for him to be acquainted with.

W. Williams, *Principal.*
Peter Young, M.D., *Prof. Physiology.*
Thomas Walley, *Prof. Cattle Pathology and Materia Medica.*
James Dewar, *Prof. Chemistry.*
Geo. A. Davidson, M.D., *Prof. Anatomy.*

June 18*th*, 1872.

A letter was read from Professor McCall, stating that he had not been consulted in the matter by the Edinburgh College, but that he had no objection to the motion if it applied to the Edinburgh College only.

Professor Williams said the Council would believe him when he said it was through no discourtesy towards Professor McCall that he was not consulted. The Professor was not a member of the Council of the Royal College of Veterinary Surgeons, and as this matter had to be dealt with by the Council only, they (the memorialists) did not consider it proper to consult any but members. He was quite aware that any petition from himself or from his college asking the

Council to deal with the Edinburgh College only would be illegal, and that all motions affecting the students would of course extend to every teaching school. If exception was taken to the word "Edinburgh," and his motion was to be thrown out upon that, he would at once withdraw it, and give a fresh notice of motion for the next meeting. When the memorial was drawn up he took exception to the word "Edinburgh" being there; but Professor Dewar, who had prepared the draft, said that he looked upon the latter portion of the paragraph as applying to the students of all the teaching schools. He would take the opinion of the Council whether he could bring this motion before them, intending it to apply to the students of all the teaching schools.

Professor Brown did not pretend to know what motives might have actuated Professor Dewar in drawing up this memorial, but he had a strong impression that it was entirely incompetent for the staff of any of the teaching colleges to ask the Council to legislate for the conduct of the whole of them. He read the memorial as being distinctly applicable to the students of the Veterinary College in Edinburgh. No doubt the propositions were, at least in principle, desirable ones. It was very important that they should have some rearrangement of the system of examination and probably of the system of teaching, but he confessed he did not at all perceive how this change could possibly be effected without radical alteration in the arrangement of our sessional course of instruction. The transference of the examinations to July would be rather a serious matter, certainly for the students of the London College.

As the matter now stood, if the proposition was to apply to the whole of the colleges he apprehended it was not competent for the Council to discuss the question until they had an application from the principals of each of the colleges.

Professor Simonds said it was not his intention to discuss this matter now, because he held a very strong opinion that the Council could not entertain any matter affecting the bye-laws of the College without due notice being given. He had been in no way consulted with regard to this proposal; but he did not complain of this, for such a step would have been premature as the motion now stood. He agreed most fully with many of the remarks made by Professor Brown that they could not think of altering the time of holding the examinations unless, in fact, it was altered so as to make the teaching in the several schools correspond with it. An entirely new arrangement must certainly be made

in the London college, whatever would have to be done in the Scotch colleges.

Mr. Williams said the question to be considered was whether in consequence of the word "Edinburgh" being introduced into the motion, and so limiting it, it could be brought before the Council in any other shape on that occasion. He thought it would be very much better if the whole subject was referred to a special committee for consideration, in order that they might take evidence and ultimately bring a well-digested motion before the Council. There was much that was good in the proposition brought forward. The division into first session and second session men was a most admirable one, because if the pupils were divided into those two classes they would be able to concentrate their intelligence upon one subject and so make themselves masters of it, instead of having half a dozen subjects every day to listen to and discuss. The opportunity was a very favorable one for their considering whether the division would not be a great advantage to pupils, teachers, and examiners.

Mr. Mayer read the notice of motion as a petition emanating simply from the professors of the Edinburgh College with reference to their own College. He quite agreed with many of the clauses. It was very proper indeed that the examinations should be divided. He had always been an advocate for two examinations instead of one, and for making the first a written one, corresponding to the Oxford "Littlego." He thought the best thing to be done was to receive this petition and refer it to a Select Committee, and therefore moved "That the Petition from the Professors of the Veterinary College of Edinburgh be received, and that the suggestions therein contained be referred to a Select Committee to report thereon, as well as if it is desirable to make any and what alterations in the present system of examination."

Mr. Fleming said he had misread the motion, which now seemed to have two meanings when he thought it had only one. He imagined the motion applied only to the Edinburgh school, and they ought first to ascertain whether the whole of the schools were to be included. Professor Williams stated that it was intended to bear upon the whole of the schools. They must satisfy themselves about that because the teachers of the London school had not received any intimation of this, and were not prepared to discuss the matter.

Mr. Hunt seconded Mr. Mayer's motion, because he considered, under the circumstances, it would be the better plan

to have the matter thoroughly investigated by a Select Committee.

Mr. Wilkinson proposed that Professor Williams should be heard as far as he wished to speak on the subject, and the Council assenting to this course,

Professor Williams said he felt that the word "Edinburgh" seemed to spoil the whole sense of the thing; but if they would accept it as he had explained it, he would speak upon the question. In answer to what Professor Brown said, that no staff of teachers should petition or dictate to the Royal College of Veterinary Surgeons, he replied that he stood there as a member of the Council, and made the motion in that capacity, and not as a professor at all. He represented the feelings of his College, but did not speak for the benefit of one individual veterinary school, but for the benefit of all future veterinary students. He did so first of all on the ground of expediency. As a matter of expediency they should follow the footsteps of the medical profession, who had found it necessary to examine their students at least upon two or three occasions. It was also a matter of justice to the students, to the professors, and to the public. When the rules and bye-laws of the Royal College of Veterinary Surgeons were first framed, the teaching at the schools was very different to what it was now. Formerly many of the schools had but one professor, and but two or three subjects were taught, and meagrely taught, compared with the teaching of to-day. The students were then examined by their own teachers. Now the student had to attend and learn five or six distinct subjects, and how could a young man be expected to attend five lectures per day and get up all those subjects thoroughly? It was an impossibility. The best of their students—those who worked hard—were, at the end of the session, almost incapable of working. To sit down to five lectures a day was more than any one should be called upon to do; but the student was compelled to do it to meet the requirements of the examination, and in many cases the knowledge so gained was exceedingly superficial and was forgotten in a very short time. Then, on the score of justice to the teacher, it was most unfair for anybody to ask him to teach pathology and the practice of medicine to a student totally unprepared to understand one single word of it. The man should be first allowed to study his anatomy, his chemistry, and materia medica, and then he would be fitted to go to the higher branches of professional study. But when a number of students who had never heard a lecture in their lives came to hear pathology and physiology, what could they understand of these subjects? The

consequence was that many of them passed a very poor examination compared with what they ought to do. Finally, the present system was an injustice to the public. If his motion was adopted it would, in the first place, show the public that the Royal College of Veterinary Surgeons desired to support some reform, and in the next place it would be a guarantee that the possessor of its diploma was worthy of the piece of parchment. He hoped the Council would consider the subject favorably, as he was convinced it was for the benefit and advancement of the profession. As to the carrying out of such a scheme, it would be a very easy matter.

Professor Brown said there was nothing he should like better than to have the whole question of the bye-laws referred to a select committee, with a view of giving the Council power to make alterations in the examinations as were expedient. As the bye-laws stood at present they were needlessly fettered. He suggested that Professor Williams should withdraw his motion, and move a positive motion to the same effect, indicating his desire as a member of the Council that the whole subject of the examinations should be reconsidered and rearranged. At present they could only entertain the question as it referred to the Edinburgh Veterinary College. He proposed, as an amendment, that the motion be received according to the obvious meaning of the terms employed.

Mr. Owles seconded the amendment.

After some further conversation Mr. Mayer struck out the last clause relating to the other schools, and thereupon Professor Brown withdrew his amendment.

Professor Williams objected to the motion if it was to limit the action of the Committee to the Edinburgh College. It was quite incompetent for the Council to discuss the question in that form. They could not possibly deal with the examinations of one school. They must be alike at all schools, and the petition was for the purpose of having them so. If the motion was adopted he should withdraw his petition altogether, and go back to Scotland with a not very favorable report. He objected to the withdrawal of the latter part of Mr. Mayer's motion, since new light had been thrown upon it.

Mr. Mayer said he never intended to fetter the action of the Committee in any shape or way, having too much at heart the interests of the profession. The whole question of the examination required ventilation and discussion, for he was not at all satisfied with it as it was, and was glad that the whole question was to be opened. He hoped it would

not be thought that he wished to fetter the Committee, because sooner than do that he would withdraw the motion altogether.

Colonel Fitzwygram moved, as an amendment, that a special Committee of the Council be appointed to consider the whole question of the mode of examination of students.

Mr. Fleming seconded the amendment, as being the only way in which they could get out of the difficulty. The whole question required going into, and the erroneous impression which Professor Williams appeared to entertain as to the feeling of the Council would be removed if this amendment was carried.

The amendment was then carried by a majority of sixteen to six.

The original resolution, as proposed by Mr. Mayer, was rejected by fourteen to seven.

Some discussion then ensued as to whether the Select Committee to be appointed should include the Principals of the different Colleges; and it was ultimately resolved, on the motion of *Mr. Hunt*, seconded by *Mr. Dray*, that the Committee should consist of the President (M. J. Harpley, Esq.), the Principals of each of the Colleges, Colonel Fitzwygram, and Messrs. Wilkinson, Mayer, and Fleming.

Professor Brown proposed that the petition from the Professors of the Edinburgh Veterinary College be laid before the Special Committee at their first meeting.

Mr. Fleming seconded the motion, which was agreed to.

It was announced that the Christmas examinations would be held in the week commencing the 16th of December.

The Secretary reported that on the subject of the place for instituting the practical examination of the students of the Royal Veterinary College, the following letter had been received from the Principal of the Royal Veterinary College.

ROYAL VETERINARY COLLEGE;
Aug. 5th, 1872.

DEAR SIR,—I have the pleasure to send you, subjoined, a copy of a resolution which was passed at the meeting of the Governors of the College, held on the 3rd instant.

This resolution, as you will observe, relates to the practical examination of the students by the Court of Examiners acting for the Royal College of Veterinary Surgeons.

I am, &c.,

(Signed) JAMES B. SIMONDS.

W. H. Coates, Esq.

"Practical Examination.

"Proposed by *Mr. Wilkinson*, seconded by *Lord Portsmouth*—

"That the Council of the Royal College of Veterinary Surgeons be invited to conduct the practical examination of the pupils of this College in the Institution."—Carried.

On the motion of *Mr. Fleming*, seconded by *Mr. Cartledge*, the thanks of the Council were accorded to the Governors of the Royal Veterinary College for their kindness in allowing the Institution to be used for the proposed purpose.

The *Registrar* next read the obituary report.

Finance Committee.

The Report of this Committee was received, and cheques were ordered to be drawn for paying the accounts, and also for the examiner's fees and insurances due at Christmas.

Special Committee.

The Report of the Special Committee appointed to inquire into the terms upon which the sum of £37 14*s.* 7*d.* was presented to the Royal College of Veterinary Surgeons by T. W. Mayer, Esq., in 1849, was brought up and read. They reported that the evident intention of the donor in presenting the sum was, that it should form the nucleus for a building fund, and recommended that the amount should be transferred from the general account of the College, with interest upon the same, for twenty-three years and a quarter, at three per cent. per annum. They further recommended that the increased sum should be appropriated for the specific purpose for which the gift was originally intended, and that an application should be made to the members of the profession for donations and annual subscriptions towards the establishment of a permanent building fund.

The Report having been received, *Mr. Wilkinson* asked whether the Council could legally pay interest on the sum named, and suggested that their solicitor should be consulted as to whether they would be justified in so doing. He moved "That the President be requested to obtain the opinion of the Solicitor of the College with reference to the legality of the payment of interest on the original sum given by Mr. Mayer in 1849, namely, £37 14*s.* 7*d.* as a nucleus for a Building Fund, and that the discussion of the Report be adjourned to the next meeting."

Mr. Dray seconded the resolution, which was agreed to.

Mr. Wilkinson drew attention to a circumstance in connection with the examinations, and remarked that the law by which they were regulated was, that a pupil coming up for examination for a diploma had to present documentary or some

other evidence as to his having been educated at one of the schools. Had that law been carried into effect up to the present time, or had it for some reason been omitted? A gentleman came up for a fifth time to the Examination in May. The Governors of the Royal Veterinary College in July, 1871, passed a resolution that after three periods they would not give any further certificates. He wished to know whether the candidate referred to presented a paper of any kind from the principal of the Veterinary School in London, to the effect that he had been educated at that College.

The Secretary reported, that at the May examinations one student came up for the fourth time, and one for the fifth, and they were examined on the authority of the certificate received from the Royal Veterinary College on April 8th, 1872, which stated:—"I certify that the following students have been duly educated at the Institution, and that they are therefore qualified to present themselves as candidates for examination for the diploma of the Royal College of Veterinary Surgeons," and it then stated that these gentlemen had been previously examined. That was signed by the Principal of the Royal Veterinary College.

Professor Simonds said all he did was to attest that these gentlemen had been previously examined.

Professor Williams thought it was giving the Principal of a College a great deal too much power to allow him to give a certificate of a kind which would enable a student to undergo an examination. The Board of Examiners ought to satisfy themselves that the pupil had studied the various subjects on which he was to be examined. The certificates should be signed by every Professor in the College. This was one of the things which the Committee just appointed would have to inquire into.

Professor Simonds denied that the governing power of an institution could not make its own rules and regulations, perfectly independent of the Council. It would be found that the Governors of the Royal Veterinary College would make just such rules and regulations for the institution, and for the instruction of the pupils, as they saw fit. As to the certificate alluded to, he would merely observe that when he signed that document he was only in office *pro tem.* The appointment of the Principal had not then absolutely taken place. He therefore had no power to alter any rule or regulation of the College, and, acting upon precedent, adopted by his late lamented colleague, Professor Spooner, he signed the document put before him, to the effect that certain gentlemen had been educated at the Royal Veterinary College. With reference to the matter as to what power should be vested in a Prin-

cipal, he would tell Professor Williams, for his satisfaction, that the rule complained of had at the present time no existence in the College. No future Principal, so long as those rules remained intact, would be in a position to give a passport from the College of himself. The pupil would receive certificates from each of the teachers, and unless he obtained the signature of each professor no certificate would be given by the Principal.

Mr. Fleming said there was an omission in the report of the last Council meeting, which might mislead some people who were not present. In the discussion on the propriety of having medical men as examiners, it was deemed by one of the speakers that he (Mr. Fleming) had made some reflections upon the teachers of anatomy in the schools. He got up immediately afterwards, and denied having cast any reflections on those teachers. The remarks made by him were inserted in the report in the *Veterinarian*, but his subsequent explanation was omitted. He wished this to be rectified, as he had not the slighest intention of reflecting upon the gentlemen in question.

The Council then adjourned.

CENTRAL VETERINARY MEDICAL SOCIETY.

The second annual meeting of the above Society was held on Thursday, October 3rd, at 10, Red Lion Square, George Fleming, Esq., President, in the chair. After the minutes of the last annual meeting had been read, the report was presented and read by the Secretary. The report dwelt on the success and advancement achieved by the Society, together with its financial position, which was also of a thoroughly satisfactory nature. The subjects introduced throughout the year had been numerous and well considered. The attendance had been an average of seventeen, the largest attendance being twenty-one fellows, the smallest twelve. The Society numbers fifty-one Fellows, of whom forty-three are resident, six non-resident and two honorary. On the conclusion of the reading of the report, it was received by the Fellows on the proposition of *Mr. J. C. Broad*, seconded by *Mr. J. Woodger, sen.*, and adopted on the proposition of *Mr. T. W. Gowing, sen.*, seconded by *Mr. Woodger, sen.*

A ballot was then taken for John Wilkinson, Esq., who was

proposed as an Honorary Fellow; he was declared unanimously elected.

The election of officers for the ensuing session was then proceeded with, when *Mr. Gowing*, in referring to the constant attendance and zeal of the retiring chairman, the *President* proposed as his successor Frederick J. Mavor, Esq., a gentleman connected with the Society from the commencement and a sincere labourer in its advancement. The result of the ballot declared Mr. Frederick J. Mavor unanimously elected President, and Messrs. Fleming, Cox, A. Mavor, and Col. Fitzwygram, as Vice-Presidents. The Treasurer and Secretary were re-elected.

Mr. Burrell then proposed a vote of thanks to the President, which was seconded by *Mr. Woodger*, and carried unanimously; the *President* responding to the same.

Votes of thanks were accorded to the Secretary and Treasurer, and respectively acknowledged.

Captain Russell, M.R.C.V.S., was proposed as a Fellow. His election will be considered at the next meeting, when a paper on "Roaring" would be read by Mr. Hunting.

JAMES ROWE, Jun.,
Hon. Secretary,

THE SCOTTISH METROPOLITAN VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of this society was held at Cumming's Hotel, Lothian Road, Edinburgh, on Wednesday, 14th August, at 2 p.m.

Mr. Balfour, Kirkcaldy, Vice-President, in the chair.

Present:—Professor Walley; Messrs. Borthwick, Kirkliston; Aitken, Dalkeith; Connachie, Selkirk; Cumming, Edinburgh; Black, Howgate; and the Secretary.

Mr. Steele, Biggar; Mr. Romanes, Veterinary Inspector, Leith; and Mr. Young, East Calder, were also present as visitors.

Letters were received from Mr. Aitken, Kilmarnock, and Messrs. D. Maclean and James Anderson, Glasgow, regretting their inability to be present.

Mr. Black, Howgate, was elected a member, and Mr. Young, East Calder, proposed by the Secretary, seconded by Mr. Borthwick, as a member of the Society. Election to take place at the next meeting.

Professor Walley gave notice that at the next meeting he would bring forward a motion relative to the fees for examination as to soundness, stating that, without entering at present on the subject, there was great need for reform in the matter.

For the first time the introduction of reports of interesting cases formed a regular part of the proceedings.

Mr. Borthwick brought forward a case on which he was at present engaged. A four-year-old valuable cart-horse was bought from a dealer at a fair, in a neighbouring town, on the 10th July. He did but little work afterwards, having a slight touch of cold; but on the 29th of the same month Mr. Borthwick, on being called in, found him affected with tetanus. On inquiry as to the cause, the man in charge at once said there had been some warts or angle-berries, as they are called, cut off from his belly, and on examination Mr. Borthwick found three distinct patches on the belly, and one on the shoulder, from which warts had evidently been recently removed, one of them, in particular, being raw, suppurating, bulging out, and covered with a hardened scab or crust. The horse was treated in the usual way, viz. rest, quiet, slings, belladonna, &c., with poultices, &c., to the raw parts. He rallied a little at first, but relapsed and died on the 7th August. Mr. Borthwick had given it as his opinion that the removal of the warts was the cause of lock-jaw, and that whoever had caused them to be taken off was liable for the price of the animal, and in consequence the gentleman who bought the horse intended to pursue the dealer at law for the amount. After repeated inquiries it had transpired that the horse had passed through two other dealers' hands the day before the fair, while the party from whom the horse was originally bought admitted having caused the warts to be cut off, but stated that it had been done as far back as January last. Mr. Borthwick now exhibited part of the skin of the belly and shoulder, and asked those present for their candid opinion of the case, and what course they would advise his client to take. After a careful examination it was the unanimous opinion of the members that the warts had been removed or at least treated with caustic, within a month from the present date, and that, in the absence of any other apparent cause it was reasonable and just to conclude that that was the cause of the lock-jaw; but, considering the "glorious uncertainty of the law," it would be better to try, if possible, to compromise the case before entering on legal proceedings.

Professor Walley then read an account of a case of "Fracture of the Inferior Maxilla of a Mare, followed by Cerebral Symptoms and Death," the particulars of which had been communicated to him by Mr. Aitkin, of Dalkeith, who attended the animal.

The mare, the property of Lord Melville, was discovered early one morning with half the anterior part of the lower jaw hanging pendulous. No cause for the fracture could be assigned. The halter with which she had been secured was found broken. The fractured portion of the jaw was placed in its proper position and secured there by means of copper wire, and all went on well for four weeks. At the expiration of that time, on a Tuesday morning, epistaxis was observed, which was arrested by the application of cold water to the head, and before night she appeared quite lively and ate satisfactorily. On the following morning she exhibited symptoms of cerebral disturbance by walking in an unsteady manner, with the head turned to the right side, in a continuous circle, in her box. The pupils were dilated, and she stood (except when perambulating the box) with her forelegs wide apart like props, trying to preserve her equilibrium, and endeavouring to bring her head against the wall to obtain pressure on the occipital region. As she was an old mare no treatment was had recourse to, and she was destroyed.

Post-mortem Examination of Head.—"At the request of Mr. Aitkin," said Professor Walley, "I undertook this duty. I found all parts of the brain perfectly normal until I raised the cerebellum and divided its connection with the medulla oblongata, when I discovered, posteriorly to the valve of Vieussons, and stretching transversely over the whole width of the cerebellum, a new vascular growth, nodulated on its free surface, and from two to two and a half inches long, three quarters of an inch wide, and about one sixth of an inch in its deepest portion. This growth was, in my opinion, the result of injury to the plexus of blood-vessels on the inferior surface of the cerebellum, received by *contre-coup* at the time of the accident, and, if I may so express myself, consisted of healthy or exuberant granulations, which did not interfere with the functions of the brain until they became so large as to produce pressure on the cerebellum and medulla oblongata, giving rise to the symptoms observed. If any serum from effusion existed in the fourth ventricle it had escaped through the foramen magnum when the animal's head was removed from its body."

Professor Walley next exhibited part of the vagina and uterus of a heifer, in which the peculiar "twist" of the neck of the uterus occasionally met with was very distinctly shown. The Professor stated that the case occurred in the practice of Mr. Brown, West Calder, from whom he had not as yet received particulars, but he believed that the heifer, being quite unable to calve, had been destroyed. He was not aware that turning the animal over and over with a view to unravel the "twist" had been had recourse to, but even had it been successful parturition

could not have taken place, owing to the thickened and hardened state of the os uteri. He directed attention to that part, and to the excessively vascular state of the uterus itself, and the peculiar "plugged up" state of many of its blood-vessels.

The specimen having been examined an animated discussion took place on the question, Whether it is ever justifiable to enlarge the opening of the os uteri by the knife? It appeared to be the general opinion that while that operation should never be performed till it is actually necessary, still there are cases in which the os uteri does not dilate sufficiently, and in which there is great danger of the animal sinking, and that in such cases the os uteri should be cut into, and that this can be done with comparative safety. The Chairman stated that he had performed the operation eight times with only two deaths; and others had also done it with success. The best place for the incision, Professor Walley stated, was towards the upper part, and a little to the side. Very slight hæmorrhage generally follows, and the animal needs little treatment, if any, afterwards. Mr. Steele, however, was of opinion that the operation was quite unnecessary, and should not be performed. With sufficient time, he maintained, the os uteri will always dilate.

Professor Walley then laid before the meeting what he stated could scarcely fail to be very interesting to every one present, viz. the fourth stomach of the animal which had died on Bremtsfield Links from what had been suspected to be rinderpest. "It was well known," said the Professor, "that lately a vessel, The Benachie, from Russia, had put into Leith Roads with a lot of cattle on board affected with the rinderpest; that these cattle had been detected, and prevented from landing by Mr. Romanes, the Inspector (now present); and that afterwards, in accordance with orders received from the Privy Council, the cattle were sent forty miles out to sea, slaughtered, and thrown overboard. Well, shortly afterwards, the cry was raised that a lot of Iceland cattle on Bremtsfield Links, in the centre of this city, were suffering from rinderpest, and that one of them had died. The carcase had been taken to the abattoir, and I was called on to make a *post-mortem* examination along with Dr. Littlejohn, Mr. Romanes, and the City Inspector, and, though after a careful examination we came to the conclusion that the animal had died from muco-enteritis, the result or accompaniment of eczema or foot-and-mouth disease, still knowing how very closely in many respects eczema and rinderpest resemble each other, and taking into consideration the fact that the owner of these Iceland cattle and his servants were known to have been frequently on board The Benachie, in contact with the rinderpest cattle, we considered we were justified in not giving a

decided opinion till next day, when, finding others of the herd showing undoubted symptoms of severe eczema, we allowed our opinion to be made public."

The mucous membrane of the stomach now shown was excessively dark in colour, almost black, presenting numerous small ulcerations of an oval shape, and in some parts solution of continuity to a very considerable extent had taken place, the muscular coat being involved, and in one particular spot to such an extent that complete perforation of the organ had taken place. In forming an opinion as to whether the animal had died from muco-enteritis or from rinderpest, Professor Walley stated that he was greatly guided by his observation of the fact that in rinderpest ulceration thoroughly established is only seen in the last stages—that solution of continuity shows itself by cracks or splits traversing, as it were, the surface of the mucous membrane, and that these cracks or splits are always preceded by white lines. Again, in rinderpest the mucous membrane may be seen studded with little red spots, and these becoming darker in colour end also in ulceration; but, in the stomach now shown, the white lines and cracks were not present, and the spots, though distinct, were dark-coloured and depressed, and the whole membrane excessively discoloured and ulcerated.

Of enteric disease—muco-enteritis—of cattle, Professor Walley remarked that all the symptoms were aggravated by fatigue and low condition, while the presence of another disease always causes affections of this kind to run their course more quickly and with greater urgency of symptoms, and that there are some cases in this country of enteric disease which are but seldom seen, and which can scarcely be distinguished from rinderpest. To this class, probably, belong the cases met with towards the termination of the cattle plague in this country over which many of the principal veterinary surgeons met in consultation and in regard to which much discrepancy of opinion existed.

In remarking upon the diseases eczema epizootica and rinderpest, Professor Walley called attention to the fact that they possessed many characters in common, both with regard to their propagation, manner of attack, symptoms, and *post-mortem* appearances. The discharge from the eyes and nose and the peculiar excoriated appearance of the sheath and penis is alike in both diseases, the state of the lips and gums very similar, though the ulceration of rinderpest on these parts may always be known by its base being of an excessively red or scarlet hue, while in each the fourth stomach may be affected. In the cattle on board The Benachie the same condition of the sheath and penis, the same character of discharge from the nose and eyes,

were observable as in many of the cases of eczema occurring in the animals from Iceland. The fourth stomach and the bowels also presented similar appearances. In one case of eczema the lenticular spots on the mucous membrane of the former were very distinct.

"Imported cattle," the professor went on to say, "are most susceptible of and suffer most from contagious diseases, and it becomes a question whether it is not advisable to prohibit entirely the importation of store cattle, and to insist upon the slaughtering of all the animals at the ports. The present visitation of eczema seems to be more virulent than preceding ones, not only in Scotland but in some parts of England also."

Professor Walley then read his "Essay on Parturient Apoplexy," which was listened to with marked attention. At its close it was resolved, as the usual time of meeting had expired, to adjourn the discussion till next meeting. A very hearty and cordial vote of thanks was accorded to Professor Walley for his essay and the many other interesting subjects he had brought forward. Several of those present expressed their sense of indebtedness to the professor, more especially considering the study and research the former, at least, must have entailed. A unanimous wish was also expressed that the essay should be sent to the *Veterinarian* for publication, so that members might have the opportunity and the pleasure of reading it at their leisure.

The usual vote of thanks to the chairman terminated the proceedings.

C. CUNNINGHAM, *Secretary*.

PARTURIENT APOPLEXY.

An Essay read by Professor WALLEY, Edinburgh Veterinary College, 14*th August*, 1872.

IN considering the formidable disease of parturient apoplexy it will be necessary to set aside old notions as to the pathology of the disease, and also to divest our minds at once and for ever of many of the absurd and illogical titles by which from time to time, it has been known and designated. Milk fever, puerperal fever, dropping after calving, and a host of other terms (provincial or otherwise) have been used to indicate the pathology of an affection to which in many instances the assignation of a pathology is merely hypothetical. The term which is now by common

consent adopted, viz. parturient apoplexy, does not in some cases give us even a remote clue to the causes in operation to produce the disease or to their effects, for very frequently true apoplexy, *i. e.* sanguineous effusion within or upon the brain, is not discovered by *post-mortem* examination. Hence we are led to conclude that our ideas as to its pathology are but crude at the best, and ill account for all the phenomena we witness in this intractable affection. One method only exists by which we can get rid of this seeming anomaly, even although we may still retain the term parturient apoplexy, with which we are all acquainted.

If we could certainly aver that true sanguineous effusion or even repletion of the vessels of the brain always existed, then we should have no difficulty in the matter, but inasmuch as this is not always the case the term without qualification is untrue. The method I would wish to adopt is to endeavour to bring the causes of this disease under two heads, viz. those which may be truly called apoplectic, from direct compression, and those which cannot be called apoplectic because no compression or repletion is proved to exist, but in which by careful research we can always trace the effects produced by them to indirect action on the various nerve centres.

The term parturient is derived from *pario*—I bring forth—"apoplexy" from the Greek, *sig.* I strike or astound. In so far then as there is always sudden and often violent invasion of the disease occurring at the time of parturition, we acknowledge and retain the term. Congestive Puerperal Fever I have sometimes thought is not an inapt designation, especially in a great many cases where we find congestion of several important organs of the body following in rapid succession after the original affection has passed away.

At one period, and that not far distant, all cases affecting the spine or the brain in cattle immediately after, or during the act of parturition, were called milk fever. Hence the great name which some men obtained for their power of curing the disease; hence, too, the non-exercise of proper discrimination in treating it. It will be as well before entering further into the subject to inquire with what diseases it has been, and is even now, frequently confounded. The first is "paralysis;" this we can dismiss with a few words, as we have no affection of the brain proper, no loss of sensation, and but little interference with the natural secretion or excretion—neither is it confined, as a rule, to the one animal, the cow; moreover, it is a disease affecting equally uniparous and multiparous animals. With "metritis" the case is somewhat different, and I can easily understand a superficial and unscientific observer confounding the two diseases, for we have the same general prostration, the same carelessness of surrounding objects,

the same indications of pain by kicking and throwing the head back to the sides, although there is a marked difference in the violence with which the latter is accomplished; and the unwillingness to rise when down might easily lead to the conclusion that the animal was incapable of doing it, especially when coupled with the unsteady movements frequently evinced when in the upright position. One other disease, viz. "cerebritis," occurring as the result of exposure to the rays of the sun or other cause, may be also confounded with parturient apoplexy. We seldom, however (especially in the early stages) have the same accompanying paralysis, the muscular power being increased instead of decreased.

With regard to its resemblance to any parturient affection in the human subject it may be said that puerperal convulsions alone has any analogy to it. Although apoplexy does follow parturition in the human subject it can generally be traced to psychical, rather than to physiological causes, and often occurs at a considerable period after the act of parturition, from well-defined causes in connection with, or resulting from, that act.

Some authorities have attempted to draw a distinction between paralysis and parturient apoplexy by stating that they differ with regard to their period of invasion, but this must necessarily be fallacious, inasmuch as we have both diseases making their appearance before, during, and after parturition; this you must all be able to prove by experience.

Is it a blood disease? I say decidedly no; although with all due deference to those who believe it is, and who have laboured hard to establish that belief. I am quite aware that a diseased condition of the blood may act as an exciting or proximate cause, but in this case it is only a symptom of an already existing disease. That it is not a blood disease is proved by the fact that there are neither effusions, extravasations, nor exudations in the muscular or cellular tissues (except as the result of pressure and congestion), and one or other of these always occurs in true blood diseases. The blood is of a plastic character, but this is due to the peculiar condition of the nervous system, and to the increase of azotized principles in its structure, and we have a familiar example of sudden alteration in the normal condition of the blood by what is supposed only to affect the nervous system, viz. electricity, in lightning.

Few veterinary surgeons, I imagine, will now deny the nervous origin of parturient apoplexy. I know not who was the first to teach this doctrine, but I believe Professor Simonds is accredited with being the first to call attention fully to it. In this paper it will be my endeavour to show you to what extent, and how, the nervous system is affected in this disease.

In order to carry out this design it will be necessary to illustrate by a diagram the relationship between the sympathetic and cerebro-spinal system of nerves, and by calling your attention to a remarkable physiological fact which was first discovered by Monro, jun., afterwards illustrated by Abercrombie and Dr. Kellie, and defended by Dr. Reid. Its accuracy has been denied by some physiologists, but, so far as I am able to judge of evidence, the denial or disproval of the fact has not been established.

The fact, which materially affects our views of the disease under consideration, and also guides us in treatment, is this:—"That the cranial cavity can only contain a given quantity of matter at one time, that is, if one portion of its solid or liquid contents is removed or altered in position it must be replaced by another, as no vacuum can be formed in it, nor can the external air obtain entrance to the spot from whence the fluid or solid is displaced." This is accounted for by the fact that the bones of the cranium form a solid cupola which resists atmospheric pressure. Hence, if we withdraw blood from the veins, the arteries are immediately filled to preserve the plenitude of the cranium, and *vice versâ*. I have said that this is an important fact, inasmuch as it teaches us that once a clot is formed in the arteries of the brain no amount of bleeding will alter the quantity of fluid within the cranial cavity, as, however much may be abstracted from the jugular vein there will still be the same quantity of blood in the sinuses as before the venesection.

If it were possible for pressure to be exerted on the blood-vessels of the brain it could only act upon the arteries, because of the peculiarity of the venous circulation, and we frequently find that the walls of the sinuses are absolutely incompressible—from the development of hard material, as cartilage, &c., within their structures—by any force which excited or increased circulation could bring to bear upon them.

Causes.—In considering the causes it will be necessary to divide them into *remote*, or *predisposing;* and *exciting*, or *proximate;* and further we must look upon them as *centric*, or those exerted directly upon the brain or spinal cord, as congestion, the formation of clots of blood, diseased condition of the blood, &c., producing true apoplexy; and *eccentric*, or those which act by reflex nervous irritation, producing, more properly speaking, convulsions. These causes may be in existence singly or may co-exist.

1*st. Predisposing Causes.*—Or those which are in existence for some time prior to parturition, and which only indirectly affect the ultimate invasion of the disease. Some of them may also be

in existence subsequent to parturition, especially improper feeding, want of exercise, organic disease, &c. Plethora, from improper feeding and want of exercise, producing a tendency to stasis owing to the loss of equilbrium in the constituents of the blood, as previously shown. Animals feeding themselves, and but scantily nourishing their fœtus, hence we seldom see an animal the subject of this disease give birth to a large calf. Obesity, or the accumulation of large quantities of fat in the organism, thus tending to a reduction of the vital force, and this reduction of vital force or nervous energy is equally as productive of apoplectic and convulsive attacks as exaltation, as proved by the disease often supervening upon previous organic disease, as inflammation of the lungs or stomach, several cases of which I have seen in my own practice. Anatomical conformation, as in animals having short cervical vertebræ and being very round in the barrel; and in this way hereditary tendency is transmitted, the tendency becoming increased by multiplied consanguinity in the same way as seen in other affections in which the tendency is hereditarily propagated. Animals giving large quantities of milk are peculiarily liable to it, probably from a greater development in the vascular system. Barometrical influences, as proved by the fact of its often occurring sporadically. All of you must have noticed to a greater or less degree that at peculiar seasons and under some peculiar electric conditions of the atmosphere we have a great influx of cases of this kind; the same thing holds good in tetanus, and in a less degree with paralysis, hence I have long since arrived at the conclusion that we do not allow sufficient credit to the state of the atmosphere in the production of many of these diseases. I would ask how many cases of tetanus should we have arising from wounds if it were not for the existence of some peculiar barometrical condition of the atmosphere, coupled with an unhealthy state of the system? and, further, in order to bring the connection of these diseases with each other to a closer issue, I may remind you of the fact that tetanus occasionally accompanies parturient apoplexy, Mr. Borthwick only very recently having had to deal with such a complication. Another remarkable fact, showing the peculiarly excitable condition of the nervous systems of cattle under particular electrical states of the atmosphere, I may bring to your notice. It is the fact that those animals which are subject to rheumatism will always be found considerably worse on the approach of thunderstorms. One dairyman in the neighbourhood of Edinburgh called my attention to an animal which he had in his possession, at that time apparently in robust health, which on two occasions prior to a thunderstorm had exhibited such violent symptoms of cerebral perturbation by convulsions, prostration, and paralysis as

to induce him to make all haste in procuring the services of the nearest butcher, and to his astonishment on returning he found her on her legs (the thunderstorm meanwhile having passed over, or developed itself) as well as she was before the attack. Thermometrical influences also exert a predisposing effect, hence we have considerably more cases in summer than in winter, though this is further accounted for by the fact that there is less consumption of carbon in hot than in cold weather, and greater lassitude of the system. Age is another predisposing cause: this truth is so well established that we seldom see the disease appear in an animal before the second or third calf.

In the human subject we see the same thing, apoplectic attacks not often arising in the pre-adult period of life, and we can understand partially why it should be so when we consider that less nitrogenized principles are required to build up the organism than in youth, hence any excess is sure to lead to repletion of the vascular system; and more than this, in age the system is not so vigorous, thus favouring any tendency to stasis which may exist. Inactivity of the urinary organs must be classed amongst the predisposing causes, inasmuch as if these organs are not performing their natural functions (and from the little exercise the animals generally have, they are not particularly active), much débris must necessarily be added to the blood (not only from the mother, but from the fœtus) which would otherwise be eliminated. The same may be said also of the skin and liver. Pressure of the gravid uterus upon the respiratory organs preventing the due oxygenation of the blood; or an impure condition of the blood from any cause acting as a morbid stimulant to the spinal cord.

Exciting causes.—Previous cerebral disease of any kind, whether parturient apoplexy or otherwise, giving rise to arteritis and brittleness of the coats of the arteries which cannot withstand the pressure put upon them during the act of parturition. Violent straining, either from constipation or from the endeavours to eject the fœtus. Constipation should ever be carefully guarded against at the period of parturition. Reasoning analogically, you must all have—at any rate those who have suffered from this unpleasant affection—been struck by the painful sense of fulness in the vessels of the head in endeavouring by violent efforts to expel hardened fæces from the rectum; and this straining has been frequently the cause of cerebral apoplexy in the human subject. How much more injuriously, then, must it act in an animal with such large stomachs as the cow, especially if superadded to the pregnant condition? And in old animals, you must bear in mind, this is intensified, as in them all the hollow viscera become more voluminous, and there is a greater probability of organic

disease existing than in younger animals. The pressure of the abdominal muscles in the act of parturition against the diaphragm, through the agency of the abdominal organs, must necessarily compress the heart and lungs and interfere with circulation and respiration, and increase the tendency to cerebral congestion should any exist. Injudicious feeding, giving rise to indigestion, acts in the same way by increasing the liability to pressure on the semilunar ganglion and solar plexus. In human practice it is found that pressure on the semilunar ganglion, in the operation for aneurism of the abdominal aorta, causes quick, and ultimately indistinct and wavering pulse, and finally death, a train of symptoms, so far as the circulation is concerned, exactly identical with those of purturient apoplexy. Pressure on the hypogastric or lumbar plexus of the fœtus during parturition, or of the head of the calf upon the sacral portion of the sympathetic nerve in its passage through the pelvic cavity. Drastic purgation, although looked upon as a preventive, sometimes becomes an indirect cause, from reflex irritation and by lowering the vital powers. Exposure to cold draughts or cold rains immediately after parturition occasionally acts as a cause, though more likely to produce metritis. Bony projections or exostosis within the cranium, although of little consequence ordinarily, may, in conjunction with the act of parturition, be an exciting cause. In the cranium of a cow which had succumbed to the disease, kindly sent me by Mr. Borthwick, I found numbers of these small spiculæ at the base of the brain. Violently, or if the system is at all below par, gently removing the placenta may produce reflex irritation, coma, and death. It has been my lot to have two such cases, both following previous inflammation of the lungs, and in which, from debility, symptoms of eversion showing themselves, I determined upon removing the placenta and then applying the truss. Proceeding to remove the placenta very carefully, I had no sooner commenced than the throes became more violent, causing eversion of the uterus in spite of everything I could do to prevent it, and before I had returned it coma came on, and both cases ended fatally.

Albuminuria is an invariable accompaniment of puerperal convulsions in the human subject, and from hearing a discussion relative thereto at a meeting of the Obstetrical Society, it occurred to me that such might also be the case in cows, and I immediately asked many of my veterinary friends to examine the urine for me, but as yet I have only had one report on the subject, and that from Mr. Cartwright, of Whitchurch, in which he states he obtained a coagulum with sulphuric, nitric, and hydrochloric acids, and nitrate of silver.

If this condition of the urine is ultimately found to exist we can easily understand that it would be a certain exciting cause.

The practice of hefting animals recently calved for show purposes is prolific of parturient apoplexy patients, especially when forcing is resorted to at the same time; and I have had the particulars of two cases given to me in which it gave rise to the disease in three years old animals—one by Mr. Connacher, of Selkirk; the other by Mr. McOnie, a student at the College—over-exertion by being driven a long distance too soon after calving, or being subjected to the excitement and fatigue of a long railway journey. I have seen four or five cases in a week in one shippon produced by the latter cause. Throwing back of the volume of blood which has been contained in the uterine vessels during pregnancy is said to be an exciting cause; but if it were so, why, as Professor Simonds pertinently asks, does it not produce the disease in the sheep and other animals, for the same thing must equally occur in them as in the cow? Inactivity of the mammary gland is another exciting cause. Nature has intended it for a safety-valve whereby the pressure upon the vascular system may be lessened, and if from any reason it fails to perform its function, it not only does not tend to remove this pressure, but it may be a source of reflex-spinal irritation, for we frequently find the udder filled to repletion with blood without the secretion of scarcely a drop of milk. How far any irritant acting upon the udder may become an eccentric cause may be understood by the fact that in the human subject the pressure of the child's lips upon the mammæ often produces excruciating spasm of the uterine walls, and if convulsions are present, induces violent exacerbation of the symptoms.

Having thus, gentlemen, given you a review of some of the exciting causes, allow me to call your attention to one which, in my opinion, gives rise to more cases of parturient apoplexy than all the rest put together—it is the absurd system of removing the calf from the mother immediately it is born. As practical men I need not tell you that the stimulus of the calf sucking causes the animal to allow its milk to flow more freely, and increases the secretion of that fluid; moreover, the operation of licking the offspring—natural to ruminants—must act as a healthy diversion to the nervous system, and keep up a moderate degree of excitement, thereby combating the tendency to local congestion, and aiding in the restoration of the checked circulation which is all the more necessary in animals of a phlegmatic disposition, and in a highly plethoric state. I do not advance this opinion theoretically: I have proved it over and over again in practice, and I would ask how many cases of parturient apoplexy, or convulsions, or even paralysis, do we see in animals that are kept in a semi-wild condition? I have seen herds of Hereford cattle (notoriously short in their necks and round in their barrels, and predisposed to this affection

when domesticated) as fat almost as it was possible to make them, kept for breeding purposes, without one of their number being the subject of parturient apoplexy (and they always produce small calves); the reason is obvious: they are allowed plenty of exercise both prior and subsequent to calving, and the calves are left with them to suck at will. I am told also that amongst the Chillingham herd attacks of this kind are rarely, if ever, observed. In those cases which arise about the second or third day after parturition it is not improbable that the detachment of small thrombi in the veins of the womb, and their lodgment in the capillary vessels of the brain and spinal cord may act as a centric cause; this is rendered more probable from the fact that in these post-partum cases the attack is frequently ushered in with rigors.

I must not pass from this point of my subject without making some remarks as to the reasons why this disease seldom follows abortion, or difficult parturition. In abortion, with few exceptions, there is a gradual severance of the materno-fœtal circulation; no sudden shock exerts its baneful influence upon the system, and very frequently it occurs in the earlier periods of utero-gestation when comparatively little blood circulates the fœtal membranes and blood-vessels.

In difficult parturition, occurring in fat animals or those in high condition, a large percentage of the nitrogenized constituents existing in the blood is used up by the active exertions to get rid of the fœtus, thus rendering the blood less plastic in its character; moreover, from the prolonged period of parturition the circulation returns to its normal condition more gradually, and excitement is kept up for some time; difficult parturition does not so often occur in fat as in lean animals, for the reason that the calves of the former are generally smaller than those of the latter, and being more docile they are not so much exposed to the usual causes of cross-births.

The pathology of the disease.—I have already referred to the fact that in many instances the sympathetic system of nerves is primarily involved, I must now proceed to show you how and why this is the case:—

Irritation of the sympathetic nerve is followed by loss of function; the primary effect of the irritation would be exalted function, which exaltation would indirectly act upon the circulatory system producing the staring eye, injected conjunctiva, and quickened pulse; the irritation being kept up loss of function follows. Division of the cervical sympathetics is followed by paralysis of the blood-vessels of the brain; the fibres supplying the blood-vessels of the head arising from last cervical and first dorsal (Brown-Séquard). Pressure on any important branch, or on

the ganglia of the sympathetic, would produce the same result as division.

Sudden excitation of the abdominal sympathetic often diminishes the action of the heart by reflex action, and sometimes kills the excitation passing to the cord, thence to the origin of the tenth-nerve, thence to the heart (Brown-Séquard). That the sympathetic system is the first to become affected is proved by the arrestation of the lacteal secretion (in post-partum cases the secretion of milk is noticed to stay suddenly a few hours preceding the attack, thus causing, as I have before stated, a revulsion of blood to the system which would have been used in lactation, and this is aggravated by the continuance of feeding and the want of exercise) and the early appearance of constipation. This loss of function is followed, first, by loss of power in the secretory and excretory organs, and accumulation of deleterious matter in the system; secondly, by loss of power in the arteries and capillaries; thirdly, by interference with respiration. The consequence of the paralysis of the arteries is the accumulation of blood in the capillaries of the lumbar portion of the spinal cord—*i. e.* when the pressure has been on the hypogastric or lumbar plexus, on the transverse inter-communicating branches which have to cross the posterior aorta, or upon the sacral branch; and, in a certain degree, when the result of reflex irritation; giving rise to paralysis or loss of power in the hind limbs, these being always the first to become affected—analogically, strong confirmation of this view is afforded by the post-partum spinal and cerebral pains of women commencing in that region and gradually extending to the head, becoming diffused thence over the front and sides of it in the direction of the various nerves—gradually the congestion extends along the cord to the cerebellum, co-ordination of movement is lost, and paralysis of the fore extremities ensues; the cerebrum also participating, the senses become paralysed; in some instances all this is the work of a few seconds; finally, the medulla oblongata is involved (either from counter-pressure or from its intimate connection with the pneumogastric and sympathetic nerves) giving rise to arrestation of the respiratory process. The continuance of the act of breathing may be thought to contradict this, such, however, is not the case, for if the pneumogastric nerves are divided or paralysed, respiration will be carried on, though more slowly, by the phrenic nerve, and the intercostal and other muscles; and, it is probable, says Brown-Séquard, "that the impression may be conveyed to the medulla oblongata through the sensitive nerves of all parts in which the imperfectly aërated blood flows; yet, the respiration being restored, adds to the otherwise injurious effects of division of the nerves."

The immediate result of the interference with the tenth nerve is, as I have said, retardation of the respiratory process, meaning—in the peculiar conditions under which the system is labouring—death from asphyxia. The muscles of the larynx do not give their aid to the process of respiration by enlarging the glottal opening, thus preventing the air from gaining free access to the lungs. The muscular tissue surrounding the small bronchia and air-cells does not contract; hence imperfectly oxidized air remains in the lungs, and the blood becomes saturated with carbonic acid, thus doing away with the natural stimulant (oxygen) to the cerebrum and nervous system generally. Anti-peristalsis of the œsophagus, (from perverted nervous function) commences, the food from the rumen is regurgitated, and from the paralysed condition of the laryngeal muscles, no opposition is offered to its entrance into the trachea, the bronchi become impacted, and death results from direct asphyxia.

When rupture of the blood-vessels at the base or within the substance of the brain takes place the impression is, of course, excited primarily in the encephalon not in the spinal cord, and the animal falls suddenly and quickly becomes comatose.

Duration of the Disease is governed by the causes, and the lesions which may ultimately follow them. I have seen an animal die in six hours from the first symptom being shown, and in twelve hours after parturition; on the contrary, I have known animals live two or three days, the comatose symptoms alternately increasing and diminishing in severity, sometimes entirely disappearing and returning in the course of an hour or two—a state of things not at all to be desired, for in my experience no case affords less hope of recovery than a relapsed case of parturient apoplexy.

Prognosis.—Depends entirely upon the symptoms, the condition of the animal, the state of the weather, the stage of the disease, and the manner of its invasion.

If the animal falls suddenly at the commencement of the attack with all the secretions and excretions in abeyance, and after a few violent struggles lies helplessly on her side; and if to this is superadded a great state of obesity, with hot weather, and feeding on stimulating food, little hope can be reasonably entertained of a recovery; if, on the contrary, the brain symptoms succeed the paralysis, the bowels are tolerably open, the udder yielding a little milk, the pulse remaining at about 70 or 80, and the animal has a lively appearance, and preserves a tolerably easy position on her breast, it is not unreasonable, putting aside secondary complications and accidents, to expect with confidence a favorable issue.

Symptoms, premonitory, may be local or systemic, or both;

they may be also sudden or slow in their invasion. In some instances animals falling down, with, to the uninitiated, scarcely any warning, as though shot. At other times symptoms may be shown for some hours before the actual attack, and it is of great importance that these symptoms should be closely watched for, as to be forewarned is to be forearmed.

The early local symptoms, are an uneasy appearance of the animal, irregularity of the bowels, decrease in lactation, loss of affection for offspring, stiffness and uncertainty in the movements. The general, are loss of appetite, slightly accelerated breathing and circulation, with irregularity of temperature.

The precursory symptoms are soon followed by more decided ones, constituting those of the first stage, viz. pulse raised to about 80 or 90; sometimes wiry and hard, at other times bounding and full, at others soft and easily compressible, depending upon various circumstances: breathing hurried, greater suppression of lacteal secretion, violent constipation, injected mucous membranes, a peculiar wild staring appearance of eye (at other times a heavy dull appearance with depression of head) with head held erect and ears pricked; tremors, especially of the muscles of hind extremities; total loss of affection for offspring; alternate plucking up of hind legs, with a jerking or spasmodic action simulating stringhalt; cold extremities, hot mouth, knuckling over of hind fetlocks, and, when made to move, the animal does so with a staggering, uncertain gait, and evident anxiety.

Second Stage.—Pulse becomes oppressed and irregular, breathing hurried, animal reels to and fro, pitches head-forwards, and bellows, (probably due to some sudden painful impression made on the nerves, or from a feeling of insecurity) makes ineffectual attempts to preserve her equilibrium, and finally rolls over with a groan, as helpless, in some instances, as a log of wood; in other cases regaining her feet for a few minutes, and making vain efforts to prevent herself falling.

Third stage.—All the unfavorable symptoms—lashing of tail, throwing head violently back to side, gnashing of teeth, sometimes champing of jaws, groaning, pulse gradually becoming imperceptible and the breathing stertorous, loss of sensibility in hind extremities, constipation more marked, the scybala or fæces being covered with bloody mucus, paralysis of sphincter vesicæ and retention of urine, meteorismus or distension of the rumen with gas, cold perspirations, intensely cold extremities, coma, dysphagia, or difficult deglutition—become intensified, violent exacerbation supervening, especially if the disease partakes of a convulsive character, in which case occasional and partial restoration of the senses may occur, the animal relapsing into coma at intervals.

Fourth stage.—Amaurotic condition of the eye (this is also frequently present in the third stage), from immobility of the iris. The orbicularis palpebrarum, becoming powerless, does not close the lids when the eye is irritated; and from interference with the fifth nerve the conjunctiva is not susceptible to the action of stimuli. The tears flow in an involuntary stream over the face, probably, as remarked by Kirke, from paralysis of the tensor tarsi muscle, the tears not being directed into the orifices of the puncta lachrymalis; the facial nerve becoming paralysed, the lower jaw hangs powerless, and the cheeks are puffed out with each expiration. There is a constant flow of saliva from the mouth, due to relaxation of the ducts of the salivary glands; finally the animal becomes asphyxiated, the sphincter vesicæ relaxes, allowing the urine to flow involuntarily, and the patient dies either in a convulsion or quietly like the expiration of the last faint glimmer of the flame of a candle. The latter is sure to be the case in apoplexy proper.

Symptoms of resolution.—Animal gives one or two deep expirations, sighs, and languidly raises her eyelids, slightly elevates her head, and evinces a wish for water, the lacteal secretion commences to flow gradually, the natural tone of the pulse is restored, the surface and extremities become warmer, and the power of deglutition and voluntary motion return.

Fatality.—The contemplation of this is the worst part of the whole performance, and yet glimpses of hope are afforded us that, ultimately, we shall be able to cope tolerably successfully with even this formidable malady, though at present we cannot but acknowledge that the percentage of deaths is far in excess of recoveries. Some veterinary surgeons I know are far more successful than others, but I do not attribute this so much to their better knowledge of the pathology of the affection, or their better mode of treatment, but rather to some peculiarly favorable influence in the climate and local circumstances, and to the class of animals treated. All must acknowledge that some breeds succumb much more frequently than others. I cannot call to mind having saved but one Alderney cow, one very unfavorable thing in connection with this breed being that they are generally so heavily laden with internal fat. I have seen it stated that these animals are not subject to the disease, but this is a very great mistake; another remarkable fact is, that we may have eight or nine recoveries out of a dozen cases at one time; whereas in the next dozen not one single recovery can be registered. In one district I have seen numbers of animals treated for this affection with the most marked ill success, and yet every method that art and science could devise had been had recourse to. In another district I have seen recoveries comparatively frequent,

though no wiser head has been at the helm, nor better methods of treatment been resorted to.

Post-mortem appearances.—We frequently hear the remark that no satisfactory post-mortem changes are found in animals that have died from parturient apoplexy. This is to a great extent true, although, in not a few instances, it results from want of opportunity or time on the part of the veterinary surgeon to institute a sufficiently searching investigation into the post-mortem lesions. The surgeon who has greater facilities in hospitals to make such examinations, has often to search, in cases of apoplexy, a long time before he can find any satisfactory change, and occasionally fails altogether in doing so, and under the circumstances, it is not to be wondered at that, in so far as the post-mortem examinations of cattle are concerned, the results should in many instances be *nil*. Again, we are apt to confine our search too much to one sphere, as the head and the spine, or to the womb itself. Now, as I have shown that so-called parturient apoplexy frequently depends upon reflex or eccentric irritation, it is plain we must diligently search not only for post-mortem appearances, in accordance with centric causes, but those also dependent upon ec-centric causes; hence, we should direct our attention to all the internal organs, particularly the bladder, intestines, and stomachs. Some have thought that because they have occasionally found impaction of the third stomach that it must necessarily be always an accompaniment of this disease, on the same principle, I presume, as the veterinary surgeon who on dissecting the leg of a horse which had been the subject of stringhalt, finding a spicula of bone in the course of a nerve, declared for ever afterwards that this was the only cause of this particular affection; but we as often find the contents of the third stomach in a semi-fluid condition as we do in a solid or dry state; and the same may be said of the contents of the intestines, and we are led to think, "what has been the use of all our purgative medicines here?" Although impaction of the third stomach, or constipation of the bowels, may be causes, they are as often consequences of the disease, and pass away on recovery from the more acute symptoms. A congested condition of the mucous membrane of the small intestines and fourth stomach has been mistaken for inflammation, and regarded as a cause, whereas it is an effect, either of congestion, in common with all the other vascular structures of the body, or of the irritation produced by purging medicines. Inflammation of these organs at the time of parturition may undoubtedly act as an eccentric cause of convulsions or apoplexy, as inflammation or chronic disease of any other internal organ may, and as such, is sometimes observed in post-mortem examinations. Congestion of the lungs is more

frequently found than not; this we can easily understand when we consider the perverted condition of the nervous functions generally, and more especially so if death has been produced by choking from the entrance of foreign matter into the trachea.

Hysteritis is seldom seen. Slight congestion of the vessels of the uterus, as it is natural to expect, will often be present. If life has been prolonged for over thirty-six or forty-eight hours after the attack, the muscles will be of a very dark colour, and of a peculiarly iridescent appearance. I am informed by Mr. Rutherford, the Inspector of the Fountain Bridge Abattoir, that he always finds this change very apparent: and when we look at the non-oxidized condition of the blood we can easily comprehend that such is the case. The brain or the spinal cord, when carefully examined, will often afford evidences of distinct lesions having taken place, either in their meninges or within their structure. In violently acute cases we nearly always find clots of blood at the base of the brain, pressing on the medulla oblongata, or if this is not so, we have either extensive venous congestion with serous effusion, arterial impaction, or the presence of distinct emboles within the arteries. But our search must not be of a superficial character only, we must lay open every portion of the encephalon and examine it minutely, and we shall, in many instances, be rewarded by finding one or more clots of blood, or softening, with a brittle or atrophied condition of the coats of the arteries, the two latter conditions probably being the result of previous disease, or we may find effusions of serum into the ventricles.

I have thought that I have detected a greater amount of vascularity in the vasa nervosum sometimes in *post-mortem* examinations of such cases.

Treatment.—As we have several well-marked stages of the disease, so must we adopt remedial measures according to the stage in which we find our patient when called upon to treat it, for it would be simply absurd to lay down one rule which should apply to every stage of the disease.

If we are called upon when an attack is threatened, *i. e.* when the very earliest premonitory symptoms are presented (unfortunately, this is seldom the case), we must have recourse immediately to such treatment as is indicated by the circumstances or condition of the patient. If we find constipation as a probable eccentric cause, we must endeavour, boldly and promptly, to overcome it by administering a full cathartic dose of medicine, not simply Epsom salts or sulphur, but croton, calomel, and aloes followed by linseed or castor oil, as required. Epsom salts only nauseate and tend by their refrigerating properties, to paralyse

the coats of the stomach. In the early stages, I think there can be no question as to the great benefit to be derived from the use of cathartic medicines. In the later stages there may be a doubt on this point, and I have often thought, "what good can purgatives accomplish when the functions of the sympathetic nerve are in abeyance?" but, again, I have had several cases in which coma disappeared with all the other bad symptoms, constipation alone remaining, which I could not overcome, and which ultimately caused the death of my patient. Mr. Kettle, of Market Drayton, tells me that he now never gives purgatives, and he is more successful in his treatment. But acknowledging that, as a rule, they cannot act until the bowels regain their normal condition, they must be of benefit by stimulating the peripheries of the nerves, and by guarding against the probability of constipation and inflammation after the other symptoms have been combated. If we have irritation of the uterus we must reduce that irritation. If the pulse is high, the lacteal secretion arrested, and the eye bright and prominent, but bowels regular, we must have recourse to sedatives, and, as the best of all, bleeding, and that fearlessly, followed up by neutral salts, aconite, and camphor, every two or three hours; or, if there is much excitement, a powerful dose of the hydrate of chloral, either alone or with opium.. Gentle enforced exercise may be also of use, with friction to the extremities, if required, and constant friction and the application of belladonna in solution to the udder. The friction to the udder in this stage does good by stimulating the peripheries of the nerves, thus aiding in the restoration of their function and the preservation of free circulation. In the other stages friction to the udder can be of little importance as all the secretions are in abeyance, and the milk, which some fancy they can press out, is only that which has been stored up in the ducts or loculi. No amount of friction will restore the natural functions of the gland-cells so long as the organic system of nerves is paralysed. Whilst having recourse to friction we should not forget to withdraw the milk as quickly as it is formed. The special action of belladonna is to relax the coats of the ducts, thus aiding in the free flow of their contents. The best friction we can have recourse to is the calf's mouth. In addition to these means we may also give diffusible stimulants and diuretics, as Sp. Æth. Nit. et Acet. Ammoniæ, especially if the skin is cold and dry and the secretion of urine scanty, and I have always found great benefit from the application of external stimuli to the loins, thereby causing revulsion of nervous energy.

Second stage.—The first thing necessary to be observed in this stage is the placing of the patient in as favorable a position as possible to enable her to tide over the results of the attack, not to

battle with its causes. If extravasation has taken place, simple preventive measures, as lowering agents, will be perfectly useless, and will only hasten a fatal catastrophe. The end to be obtained is the prolongation of life, the sustentation of the vital powers, until the brain has accomodated itself to the altered circumstances brought about by the organic lesions that may have arisen, or, if no such lesions exist, until the exhausted nervous powers have regained their functions; and, with regard to the latter point, I may draw your attention to a remarkable but simple physiological experiment, viz. the removal of a portion of a nerve from the body, exhausting its vitality by the aid of galvanism, and allowing it to rest for a certain period under favorable conditions, when its irritability becomes restored; if extravasation has occurred all devices to remove it, or to withdraw the blood from the head, are powerless, as shown by Munro, Abercrombie, &c. But even here, if the heart's action is strong, causing pressure from behind upon the paralysed or ruptured arteries, bleeding will be of essential service; but if the system is below par, or the disease partakes of a convulsive character, bleeding only acts as an irritant to the spinal cord. I would far sooner in convulsions trust to hydrate of chloral; and as during the exacerbation of convulsions, we are likely to have rupture of the vessels we should do all in our power to decrease their intensity.

With reference to the question of bleeding I may remark, as showing how men sometimes alter their opinions in such matters, that Gamgee in one of his earlier works says, "above all things avoid bleeding." Later he says that bleeding is sometimes to be recommended. Bold cathartics, as in the first stage, should also be administered, followed by diffusible stimulants, such as Spt. Æth. Nit., acetate of ammonia, and turpentine. With regard to the latter agent no medicine exerts a more specific influence on the brain, especially when there is a tendency to convulsions; independently of this it acts powerfully upon the kidneys, stimulates the coats of the stomach and intestines, aids the cathartic agents, and prevents the decomposition of food in the rumen; for the latter purpose, too, carbonate of soda will be found useful, it will also preserve the fluidity of the blood and render the purgative agents more soluble. In this stage also I would commence administering nux vomica, especially if there is much paralysis and feebleness, for in my opinion no drug has greater influence for good on the sympathetic and motor nerves; it should be given in the form of tincture, as it is much more readily absorbed than the powder.

While having recourse to these internal remedies, we must not forget the no less important external ones. Applications of a stimulating character, as fresh sheep skins (or any other which offer

themselves), to the loins may be employed with advantage. A powerful counter-irritant, as the croton liniment, should at the same time be well rubbed into the back of the poll, the roots of the ears, and over the larynx and pharynx. The benefit of this is the stimulating effect upon the commencement of the nerves which issue from the cranium, and upon the superior cervical plexus of the sympathetic, independent of its diverting somewhat the course of the blood in the arteries passing to the brain and its meninges and the medulla oblongata. All hardened fæces and retained urine should be removed, and turpentine enemas thrown up; not that I have any faith in enemas in cattle, but they may act indirectly as a stimulant, in exciting the peristaltic action of the bowels. The legs if cold should be well rubbed with common whiskey to restore the free circulation of blood in them, thus not only relieving pressure on the nervous centres, but preventing congestion and its sequelæ, exudations, suppuration, paralysis, and sloughing. If the body is cold it should be moderately clothed; the habit of some practitioners of covering up the body with sheets and straw until great perspiration is induced must, to say the least of it, be very injurious in an animal whose nervous system is already reduced, and in my opinion it is much to be condemned; by all means try to produce healthy circulation in the skin, and even a moderate degree of diaphoresis, but beware of adding to a load which is altogether more than the animal can bear. Fat animals, especially, like fat people, cannot well stand Turkish baths, and I have frequently seen patients that have been made to perspire too freely fall into a state of collapse and die, whilst previously to this untoward meddling they had evinced signs of returning consciousness. More than this, the skin cannot perform its healthy functions if it is so treated, and the reaction is always dangerous. For this reason we should never check undue perspiration too quickly, but remove the covering by degrees, thoroughly drying each successively exposed part with hay or cloths, and then enveloping it in a dry warm rug, and if it is the back applying a stimulant after the drying process. In addition to the above the patient should be frequently turned, so as to prevent stagnation and congestion of blood in important organs, and to dispel flatulence; the udder attended to, and the body kept resting on the sternum with sacks of straw, &c. If convulsions are strong it becomes a serious question whether we should not have recourse to the operation of tracheotomy, as they are always accompanied with closure of the glottis, and free respiration is one of the first things necessary to be maintained.

Third stage.—When coma is established our treatment is entirely to be altered. Bleeding is useless, as it will be difficult

to abstract more than one or two pints, no matter how large an orifice we make in the vein, for it is immediately closed up owing to the plastic condition of the blood which will even adhere to the fingers almost immediately it comes in contact with them, and I have seen animals, particularly fat ones, if bled in this stage die quietly off without an effort; and even where the circulation has been restored by the exhibition of stimulants, and the pulse full and strong, the benefit of bleeding is questionable. I have bled two cases under such circumstances, but I had cause to repent the act in each; local bleeding from the temporal artery may be useful, but general bleeding is simply murderous after coma sets in. Stimulants now are the most likely to be of benefit, particularly carbonate of ammonia and alcohol, but great perspicuity is required in the use of these; they should not be given in too large doses or too frequently. Alcohol, especially, if given in too large doses, produces its secondary depressing effects and adds to the coma; if, on the contrary, its use is too suddenly discontinued a relapse is inevitable. "It has been thought that it has a tendency to coagulate the blood, but it does not do this. It rather has a contrary effect, and in proper doses it stimulates the fibres of both systems of nerves. It has even as great an effect after the tenth nerves are divided." (Percy on Alcohol.) Alcohol may also do good by stimulating the nerves of the eliminatory functions to get rid of it from the system, but large doses paralyze these nerves, as proved by its retention for so long a period in the textures of the body, especially the brain, after its administration, and not only its own retention but that of the effete matter with which it comes in contact. Moreover, alcohol, for its elimination requires a certain amount of oxygen, which it must abstract from the solids and fluids of the system; hence, in a disease in which carbonic acid is increased in the blood large doses must be extremely injurious.

With regard to ammonia I know of no stimulant to which I would sooner trust in any case where the vital powers are at a low ebb; and I have had cases in cattle, after parturition, in which the pulse has been absolutely imperceptible, the body cold, and the animals almost *in extremis* recover in a most marvellous manner by the use of half-ounce doses of carbonate of ammonia with whiskey or brandy every half-hour, gradually lessening the dose as the patient rallied. In bad cases of parturient apoplexy we may give as much as two ounces of this salt at a dose, sufficiently diluted, and as it is eliminated by the lungs it must be a valuable preventive of congestion of those organs.

In the third stage I should still advise the exhibition of purgative medicine, or its repetition if a dose has already been administered, and also the administration of the tincture of nux

vomica. If, as is almost sure to be the case, the animal cannot swallow, no time should be lost in the introduction of the trocar and canula into the rumen (if it has not been already done) to relieve flatulence, and here I would remark that in all cases where there is the slightest evidence of the formation of gas, the canula should be always introduced; the slightest tympanitis produces pressure on the diaphragm, and adds to the congested state of the lungs; and eructations are also more likely to occur, with the risk of food or fluid being brought up the œsophagus with the eructated gases, and finding its way into the trachea; and even a greater result than this is attained by the introduction of the canula into the rumen, viz. that by the aid of a double-action syphon we can pass as much medicine as we like into the stomach at any stage without risk of choking. It is a common practice to pour large quantities of gruel into animals suffering from parturient apoplexy. This is a most hurtful and absurd system, as it only adds to the load already in the rumen, but, as all the organic functions are in abeyance, it cannot be absorbed. Cold water to the front of the head, in a constant jet, by means of a tube, or poured from a considerable altitude through a watering can, may be of service by causing involuntary deep respirations, thus relieving the lungs somewhat; but I question very much if it can have any effect on the cephalic circulation, for the reasons I have already stated, and from the thickness of the bones; and the water flowing on to the animal's straw makes her miserable and cold. Ice, if it can be obtained, is more preferable, but I have given this treatment a fair trial on several occasions without its producing any material good. In addition to the application of external stimulants to the loins, and attending to the general comforts of the patient, we may cause her to inhale the fumes of strong ammonia or burnt cayenne pepper with good effect, and the blister to the poll and larynx may be repeated.

In the fourth stage perseverance with stimulants, &c., and hoping even against hope is all that we can do.

In speaking of these methods of treatment, it must be understood that in all cases where the animal is fat and the attack violent, it is far better to slaughter than to attempt to treat, and run the risk of losing both patient and reputation; unless the owner is more desirous of saving the animal's life, than of avoiding loss.

In the convalescent stage.—Particularly if much debility exists, Peruvian bark in two ounce doses, with gentian and ale, may be given with much advantage (and more so, as its physiological action is to a great extent exerted, according to Dr. Angelo Montererdi, (see *Lancet,* 8th June, 1872), and others, on the sympathetic and tenth nerves) alternated with nux vomica.

Sequelæ.—Perhaps, amongst all the untoward circumstances occurring in the life of a veterinary surgeon, none are more annoying than the sequelæ of parturient apoplexy. Just as the coma has given place to consciousness, the patient commences to breathe hurriedly, evidencing congestion of the lungs, or pneumonia, or she rolls or tosses about with enteritis, or groans and moans with metritis or metro-peritonitis, or perchance she has each one of these diseases following in rapid succession. I have myself seen pneumonia, metritis, and enteritis thus succeed each other, and successfully battled with them as they arose; even more annoying than these are obstinate constipation, acute diarrhœa, paralysis of one or more limbs, suppuration, sphacelus, or continued amaurosis. One sequel I have seen which can only be accounted for by supposing the existence of some persistent morbid irritation of the pneumogastric or sympathetic nerves, viz., an animal lying powerless for days after coma has passed off, and breathing as quickly as its respiratory muscles could enable it, without any satisfactory *post-mortem* appearances. Many of the sequelæ are due to metastasis from the breaking down in the vessels of the brain of small thrombi and emboli, and their transportation to, and lodgment in, the small capillaries of the lungs, &c. Others are due to perverted or arrested nutrition, and others to congestion from pressure in the long-continued recumbent posture. Paraplegia may be produced by effusion in the spinal cord, and may continue for many weeks; still, if the animal is valuable, treatment as strychnia, nutritious food, general tonics with external stimulants to the loins should be persevered with, the use of slings in my opinion is to be condemned, if the animal is turned constantly and patience exercised all will be ultimately well. Strychnia should also be administered in chronic amaurosis, and blisters applied to the temporal region. In the treatment of congestive or inflammatory sequelæ it must not be forgotten that the constitution is labouring under the shock of a severe nervous affection, and that more success is to be anticipated from the employment of stimulative than of depletive agents; at least my experience has led me to this conclusion as it has other veterinary surgeons with whom I am acquainted. Other sequelæ, as knuckling over of the fetlock, must be treated as they arise with a stimulating charge, or bandage, &c., &c.

Prevention.—I think it is scarcely necessary for me to enlarge to any extent on preventative measures as they are already indicated in the consideration of causes.

The principles to be observed are the preservation of pregnant cows in as healthy and muscular a condition as possible. To avoid all causes of excitement or nervous depression either prior to, at the time of, or subsequent to parturition. To preserve a

natural state of the excretory functions, particularly the urinary and intestinal, which may be done by a judicious use of diuretic and laxative agents; this is the more necessary when we consider that the débris of the fœtus, as I have before pointed out, is added to that of the mother. It must not be thought that the free use of laxatives will always prevent parturient apoplexy, I have on several occasions seen animals attacked though they were purging to as great an extent as could be desired. Bleeding is a great preventative with some stock-owners, but I must confess that I am no advocate of the operation, unless, indeed, a great degree of excitement is present, prior to, or immediately following parturition; enforced exercise and the avoidance of fat-producing foods are of great consequence. Placing animals in loose boxes, or if the weather is favourable, in small paddocks with their offspring must of necessity be beneficial. All other animals, the sheep, the mare, the pig, are so treated, why should not the cow? In heavy milkers the withdrawal of the milk at two or three intervals, both before and after parturition, must not be lost sight of; and where much excitement is present after the birth of the fœtus an opiate should be administered; on the contrary, if there is much depression stimulants should be given.

I need scarcely remark that it is not advisable to breed from a cow which has been the subject of parturient apoplexy, as not only will the liability (from similarity of conformation) to the disease be transmitted to the offspring, but a second attack is almost sure to follow, and in the majority of instances is rapidly fatal.

I must not conclude this subject without a brief reference to the question as to whether the flesh of animals which have suffered from apoplexy, and have been slaughtered, is fit for human food. In the early stage no objection can possibly be raised to the flesh being put to such a purpose, or even in the second stage; but when much medicine has been administered, and the compounds of carbon have accumulated in the blood and muscular tissues to any extent, or a diseased condition of the blood exists, I am of opinion that, though the flesh may be safely given when boiled to pigs or dogs, and has been given in the raw state to these animals, it is not advisable to use it for human food. Notwithstanding I hold this opinion, I think it would be difficult to establish its hurtful character if properly cooked.

APPOINTMENT OF MR. FLEMING AS AN EXAMINER.

Our readers will have observed with a satisfaction equal to our own, the appointment of Mr. George Fleming, F.G.S., to the seat at the Examiners' board, rendered vacant by the appointment of Professor Brown to the Chair of Physiology at the Royal Veterinary College. We know of no more fitting member of the profession for this important office, and we doubt not that Mr. Fleming will labour with assiduous care to fill with credit to himself and to the profession the office to which he has been elected.

On Mr. Fleming will devolve the duty in particular of examining the pupils on materia medica and therapeutics.

ELECTION OF MONITORS AND CLINICAL CLERKS AT THE ROYAL VETERINARY COLLEGE.

During the past month competitive examinations have been held at the Royal Veterinary College for the office of monitor, and also of clinical clerk for the session 1872-3.

The successful candidates were for—

Monitors.

Mr. L. Butters	Liverpool.
— F. Case	Cockthorpe, Norfolk.
— J. G. Cross	Shrewsbury.
— T. Goodall	Melton Mowbray.
— S. L. Hames	Leicester.
— W. T. Kendall	Carnforth, Lancashire.
— S. Longhurst	Farnham, Surrey.
— H. F. Mullinex	London.

Clinical Clerks.

Mr. Geo. Newsome	Big Ballynatin, co. Wicklow.
— S. Longhurst	Farnham.
— W. Roots	London.
— G. W. Kerry	Newmarket.
— R. D. Graham	Woolwich.

CLINICAL CLERKS.—*Continued.*

Mr. G. F. Young	Bishopstone, Wilts.
— L. Butters	Liverpool.
— O. T. Slocock	Slough, Bucks.
— S. L. Hames	Leicester.
— F. Case	Cockthorpe.
— T. Goodall	Melton Mowbray.
— H. F. Mullinex	London.
— J. A. Lipscomb	Lewes, Sussex.
— T. Chambers	Fakenham, Norfolk.
— H. Davis	Hertford.
— W. T. Kendall	Carnforth, Lancashire.
— N. Bruce	London.
— W. Lewis	St. Alban's.
— J. G. Cross	Shrewsbury.
— J. Standen	London.

The names are given in the order in which they stand in the College register of pupils.

Names of the Freshmen who have entered on their studies, having passed the Matriculation examination conducted by the College of Preceptors:

Mr. J. E. Woods.
— H. Nixon.
— J. E. Haigh.
— A. R. Charles.
— A. Bostock.
— F. Adsetts.
— F. G. Heap.
— W. B. Fretwell.
— W. Penhall.
— W. Penhall, jun.
— W. Longhurst.
— J. T. Burden.
— R. Thompson.
— L. D. Moutray.
— D. E. Jenkins.
— G. Studdart.
— W. Cooke.
— J. Cleveland.
— W. H. Hall.
— H. Muffitt.
— H. Surmon.
— J. H. Irish.
— A. Glover.

Mr. P. W. Powell.
— J. Reynolds.
— J. H. Steel.
— W. H. Jones.
— F. Hewson.
— J. D. Edwards.
— G. W. Carter.
— F. H. Hanks.
— W. F. Clark.
— G. Plint.
— F. G. Davis.
— W. T. Gooseman.
— Col. J. Gibb.
— J. East.
— J. C. Jones.
— G. Whitworth.
— R. Ferris.
— J. D. Bremner.
— A. C. Webb.
— A. Lone.
— W. Kelly.
— C. Concannon.
— F. F. Mavor.

The following have been admitted on Educational Examination Certificates :

Mr. M. Anderson.	Mr. A. Willows.
— W. Kennedy.	— T. H. Merrick.
— C. Gresswell.	

In addition to the above, eight candidates for admission were rejected on the report of the Dean of the College of Preceptors.

Veterinary Jurisprudence.

HEAVY PENALTIES FOR INFRINGEMENT OF CATTLE PLAGUE ORDERS.

At Pocklington, before an East Riding bench of magistrates, John Fawcett, farmer, of Belthorpe, a village closely adjoining upon Yapham, the seat of the present outbreak of rinderpest, was charged with having in his possession three beasts affected with rinderpest, and neglecting with all possible speed to report the fact to the police authorities.

The charge was divided into two cases, one having occurred on the 14th and the other on the 15th of September. Several days subsequently to these dates a policeman visited the defendant's farm, and in reply to inquiries as to whether there were any beasts affected with the plague upon it, was told by Robert Fawcett (a brother) that there was one beast which was ailing, and that he had called the attention of Mr. Jepson, cattle inspector of Bishop Wilton, to it. Examination led to the discovery, in one of defendant's fields at Low Belthorpe, of five beasts suffering from the rinderpest, two of which were so ill that they could not rise from the ground. In another field four were found in a like state. The result was that on the 23rd the whole of two herds of twenty-five beasts were, by Mr. Jepson's orders, shot and buried.

It was then ascertained that three beasts had previously died and been buried, one on the 14th and two on the 15th of September; and it was to these alone that the cases referred. Two of these beasts had been found buried in separate fields, both with little surface soil and no lime; and in one of the fields where burial had so taken place nineteen beasts were pasturing. The third beast was found to have been buried in the stack-yard, and the spot covered for secrecy, as though it were intended to put a stack up over it.

The defence set up by Robert Fawcett (defendant not himself

appearing) was that he thought the outbreak to be one simply of foot-and-mouth disease, and that, therefere, it was not necessary to call in a veterinary inspector. The bench thought the cases very aggravated ones, and inflicted a fine of £40 and costs.

At the same Court, John Clarkson, farmer, of Yapham, was fined £5 and costs for unlawfully removing five beasts, "after sunset," contrary to the provisions of a pass, which authorised him to remove them on the 21st September, "before sunset."—*Eastern Morning News.*

OBITUARY.

We have to record the death of Mr. Michael Clancy, M.R.C.V.S., of Kildare. His diploma bears date May 28, 1851.

Mr. Patrick O'Connor, of Limerick. His diploma bears date April 16, 1867.

Mr. Thorpe William Bishop, of Brixton. His diploma bears date December 21, 1868.

Mr. Charles Wills, of New York. His diploma bears date May 19, 1841.

Mr. George Tegg, of Rochester, New York. His diploma bears date May 11, 1831.

Mr. Henry William House, of Bristol. His diploma bears date January 19, 1814.

And Mr. William McIndoe, of St. Vincent's Island, West Indies. His diploma bears date April 14, 1869.

MISCELLANEA.

MIGRATION OF EELS.

A CLOSE observer assures us that the following interesting evolutions occur when eels come in from the sea:—The aggregate shoal, about to ascend the inland streams, moves up the shore of the river in the form of a long, dark, rope-like body, in shape not unlike an enormous specimen of the animals which compose it. On reaching the first tributary, a portion, consisting of the number of eels adequate for peopling this stream, detaches itself from the main body and passes up; and, in the subsequent onward passage of the shoal, this marvellous system of detaching, on reaching the mouths of brooks, a proportionate quantity of the great advancing swarm, is repeated, until the entire number has been suitably provided with rivulets to revel in. Such being the wonderful instinct by which nature ordains that each stream shall be provided with a competent number of this migratory creature.

THE

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Communications and Cases.

OBSERVATIONS ON ENTOZOA; BEING THE SUBSTANCE OF AN ADDRESS INTRODUCTORY TO THE COURSE OF LECTURES ON PARASITES AND PARASITIC DISEASES.

By T. Spencer Cobbold, M.D., F.R.S., F.L.S., Professor in the Royal Veterinary College.

So far as I am aware, the special course of instruction which I have now the pleasure to inaugurate has not hitherto been attempted in any school or college devoted to the healing art. It is true that your Principal, Professor Simonds, has for many years past insisted upon the importance of your acquiring a practical acquaintance with the subject of Parasitism; and he has, moreover, in his various lectures at this institution and elsewhere, devoted much time to the exposition of those forms of cattle disease which are generally acknowledged to be due to parasites.

Not only so. Mr. Simonds and myself, some years since, conducted a series of carefully devised experiments at this College, the results of which were acknowledged to be not merely of scientific interest, but as carrying with them practical issues of high value in relation to the public health. It cannot fail to enhance the importance of these experimental researches in your estimation when I tell you that they were instituted with the approval of the Governors of the Royal Veterinary College, and carried out by the aid of funds expressly supplied to Mr. Simonds by the Royal Agricultural Society on the one part, and by donations awarded to myself by the Council of the British Association for the Advance-

ment of Science on the other. In conducting our dissections we were materially assisted by Professor Pritchard.

Recent strides in physiology and pathology having at length rendered it evident that many diseases which hitherto had been ascribed to atmospheric and other obscure causes were in reality due to parasites, the growing importance of the subject became generally acknowledged, not only in the medical journals, but also in the columns of our leading newspapers. Outbreaks of parasitic disease, affecting both mankind and animals, stirred up the workers in either department of the healing art, and thus, in a comparatively short space of time, an immense amount of scientific labour was accomplished by physicians and veterinarians, both at home and abroad. For myself, permit me to say that, some twenty years since, whilst occupying the post of Curator of the Anatomical Museum in the Edinburgh University, I diligently commenced to work at the subject of Entozoa, and during the interval that has elapsed, I have sought through every available publishing avenue, to make my investigations useful to the public. Having said this much you will readily understand with what increased gratification I enter upon the task of opening out to your minds the truly astonishing facts and experiences which have come under my notice. On public grounds, as well as on professional, I ask you to give your best attention to the data it will be my pleasure to supply. Often, no doubt, in the practice of your calling you will find certain "old wives' fables" preferred to the teachings of sound knowledge based on results acquired by years of conscientious labour; but whenever, in after life, these annoyances occur, strive to exercise, as far as you can, that degree of self-control which is, or ought to be, the most distinctive marks of an educated mind. Only resolve to act in this way and you will bring respect to yourselves and honour to the veterinary profession.

With these preliminary observations I now proceed to offer you certain general considerations, which are necessary in order that you may realise the true character, scope, and tendency of the subject before us; and here, at the outset, I may remark that the title of the course is, perhaps, the very best that could be selected. Observe; if the Governors had appointed me to lecture on *Helminthology* or on *Entozoology*, the so-called practical and unscientific people would have been frightened at the mere sight of these technicalities in the College prospectus; whilst, possibly, the less obscure title of *Parasitology* would have been also objected to.

In point of fact these three scientific terms, respectively

referring to the study of Helminths, Entozoa, and Parasites, are almost synonymous. Thus, all of them embrace a knowledge of the facts relating to creatures which, at some time or other in the course of their lives, reside in the bodies of other creatures, and whose presence during the period of that residence, be it ever so long or brief, is liable to prove inconvenient or injurious to the animal attacked. Certainly, of the three, the term Parasitology is the most comprehensive, inasmuch as it embraces all the external as well as the internal parasites.

I may here remark that helminthologists frequently employ the term *host* to designate the *bearer* of the parasite; this distinctive term being equally applicable in the case of mankind as well as in animals. In like manner, we employ the term *guest* for the parasite, as also convenient and expressive of the peculiar relation subsisting between the invader and the invaded. In the case of those "hosts" which merely entertain the guests, so to speak, as fellow-boarders, the latter may be appropriately spoken of as "welcome guests;" and, in the case of the true Entozoa, which remorselessly extract nutriment from the tissues of the invaded animal, the expression "unwelcome guests" becomes equally distinctive and applicable.

In whatever way you view this important subject of Parasitism—even, you see, whilst merely explaining terms a knowledge of which is essential to a perfect comprehension of the study—the strangest reflections inevitably crop up, one by one, before the mind's eye. Of these, those which have reference to the explanation of the possible mode or modes of origination of these singular creatures are the most difficult to deal with and to shake off.

Note, particularly, that the parasites either comprise or, in some cases, form small parts of certain more or less well-known natural groups of animals; therefore, whatever special purposes you may suppose to have been fulfilled by the creation of parasitical animals, it is quite clear that you cannot disconnect them from the intimate zoological relationships which they hold with the non-parasitical creatures. The full value and significance of this statement is, I dare say, not yet apparent to you; therefore, to put the argument in a simpler form, what I mean is this:—In the course of your anatomical inquiries you may be struck with astonishment at the apparent evidences of design manifested in the construction and adaptations observable in the organisation, let us say, of the horse. Very well. If this be so, let me tell you beforehand that we shall find the same

admirable arrangements displaying themselves in the anatomical construction of the vilest of parasites; such as obtain, for example, in the body of the mange-louse. All I contend for is, that creative force, whether accepted as conclusive evidence of design or not, is responsible for all the facts noticeable, either in the one kind of animal or in the other. In short; let me sum up by remarking that orderly mystery, if not beauty, reigns everywhere. Be the practical teachings of parasitism what they may, there is no escape from the conclusion that parasites of all kinds, both internal and external, are natural developments accomplishing purposes of the most diverse kind. These creatures, I repeat, are not the resultants of diseased conditions. The Entozoa, as I have long taught, constitute a sort of specialised Fauna, occupying a peculiar territory. What our native country is to ourselves, the bodies of animals are to them. To attack, to invade, to infest, is their legitimate prerogative. The interior and exterior of "hosts" form their proper temporary abodes; their entire structure and economy being expressly adapted to this end.

You may be sure I have no desire to carry you into the mazes in which we should be involved by attempting a full consideration of this part of the subject; therefore I propose to leave vexed questions of this sort to philosophers like Mr. Herbert Spencer, of whose distinctive views in this relation you possibly may not have heard of, though they are pointedly alluded to in Professor Acland's admirable 'Harveian Oration for 1865' (p. 15).

In this matter I have only one serious demand to make upon you. I pray you once for all to abandon the erroneous notion that internal parasites are of necessity generated as the result of certain diseased or morbid conditions of the tissues of the body of the host or bearer. Not alone amongst our country folk, but within the pale of the medical and veterinary professions, this foolish conception of cause and effect still holds its sway. Put it away from you. Abandon every preconceived opinion which like a thick veil operates to obscure your mental vision; and do not even listen to those who would unwisely persuade you that worms, parasites, and Entozoa belong to the category of "plagues" distributed as special punishments for human wrong-doing.

Before I proceed in due course to pass in review the more important facts relating to the individual forms of Entozoa infesting our domesticated animals, it is necessary that I should yet further impress upon you the true character of Parasitism. Doubtless it is correct to acknowledge certain

forms of disease produced by parasites as coming under the general designation of "evils;" for, in particular instances, the presence of Entozoa may constitute a veritable plague, in the ordinary and non-superstitious acceptation of the term; and it may be correctly spoken of as such, in the same sense as you would so speak of the "rinderpest," or of pleuro-pneumonia. But parasites hold a ground of their own; and, as a rule, it may be said that the endemic evils which they effect are, for the most part, due to overcrowding. This I shall explain more fully by-and-by; however, in the mean time, there are other facts of special significance that you will do well to bear in mind.

In the hope that I have made myself intelligible thus far, and have conveyed to your minds accurate conceptions of the intermutual relations of host and guest, I am encouraged to pass on by observing that the *Entozoa* are, for convenience sake, divided into four natural groups or categories, respectively termed *Trematoda, Cestoda, Nematoda,* and *Acanthocephala.* The first of these natural divisions, or orders, as they are technically termed, embraces the so-called flukes or flounders, including the Distomes and their allies. They are very closely connected with the Planarians, small creatures which are to be found in our ponds and ditches. Most of you are probably acquainted with the "rot" of sheep. That disease is due to the presence of the common fluke; and, as I shall show you, our knowledge of the pathology of this affection is very largely indebted to the labours of Professor Simonds.

In regard to the remaining three natural divisions or orders of the Entozoa above referred to, I will in this place only further define them to the extent of saying that the group *Cestoda* comprises the tapeworms; the division *Nematoda* embraces the round worms and thread worms; whilst the less important and small group, termed *Acanthocephala,* includes only the thorn-headed parasites, of which we have an interesting representative infesting the pig. More or less instructive types of all these orders of Entozoa will come under our notice as we proceed to discuss, in succession, the structure, character, and habits of, as well as the symptoms and diseases produced by, the different individual species infesting our domesticated animals.

THE HORSES OF THE PRUSSIAN ARMY.

By G. Fleming, M.R.C.V.S., Royal Engineers.

Perhaps at no time since the commencement of the present century, has a larger amount of attention been paid by nearly every nation to the efficient organisation of armies and the improvement in methods of conducting war, than within the last few years. The astounding catastrophe which has befallen two great military powers, and the marvellous success which has attended the arms of another, has perforce engaged the minds of military and even civil authorities, and caused endless inquiries and surmises as to what success depends upon, and what produces defeat in armies in the field. And certainly every one must be more or less interested—whether he be soldier or civilian—in what so closely concerns him, for war is now-a-days never very distant from us, it would seem; and the country which neglects preparation, which rests for security and good fortune merely upon its traditions, is not only inviting disaster when it is compelled to go to war, but is actually incurring the risk of originating war and soliciting attack.

In all that concerns the maintenance of our national honour and prosperity, in all that relates to the preservation of the high qualities which have rendered our army second to none in every quarter of the globe, the British public is now more than ever engrossed. The members of the veterinary profession generally in this country must share largely in this intense interest and laudable patriotism; but to those who have fixed their career in the army, interest and patriotism are but convertible or synonymous terms for duty and responsibility.

On the army veterinary surgeon of the present day a grave responsibility rests, not only while war is progressing, but during peace, in preparing for the exigencies of war. Though to all appearance a unit in the vast and complicated machine designated a modern army, yet, like some of the other units, important events may more or less depend upon his zeal and judgment, and the fate of armies, and even of his country, might hang upon the result of his performing his duty intelligently and energetically. It would not be proper for me now to allude to the present position of the veterinary surgeons in Her Majesty's Service, or to the very little encouragement held out to them to raise to the utmost of their power the efficiency of the British army, or to aid

in maintaining that efficiency in the field. A humble consciousness of having done one's duty must stand in the stead of public recognition of services rendered; and, perhaps, after all, no higher reward could be desired, however much it might be deserved.

My object is to draw attention to several most important questions that are being raised on a subject which it should be—though it has hitherto scarcely, if at all, been—the army veterinary surgeon's particular province to discuss, and in which his special knowledge and experience would prove of great value. I allude to the obtaining of good and suitable horses for the army; such as would not break down and become hopelessly inefficient in the first fortnight of a campaign; as well as to the keeping them in the best possible state of health and usefulness during the severe strain of active service.

Owing to circumstances which are palpable enough and easily explained, in some corps in the service the veterinary surgeon is not allowed to express an opinion as to the physical fitness of horses about to be purchased for the army, but can only certify as to their soundness or unsoundness. The absurdity of this arrangement must be particularly manifest, when the officer who may chance to be appointed to "pass-in" the horses is deficient in the special knowledge or other qualities which would enable him to select or reject particular animals. We must, then, frequently have horses purchased which are certainly sound, but so notoriously malformed or deficient in physical conformation as to be either next to useless, or certain to give way when any test of endurance is applied to them. For a horse may be perfectly sound, and yet not worth its forage, so far as utility is concerned. I am not aware that in the armies of other countries contractors have a monopoly of supplying horses, or that gentlemen who have no knowledge of a horse's exterior should be placed in the very invidious and responsible position of passing them into the army, provided that they chance to be sound. I do not assert that such is the case in our army, but the existing arrangements render such a misfortune quite possible.

Such is certainly not the custom in the army of the greatest military power in the world—that of Germany. In that country horses are purchased as they should be in this—by commission; and the whole business of remounting the army appears to be so thoroughly perfect and well adapted to provide horses *physically fit* for service, that much, very much, of the success of the German troops during the late war

must be ascribed to the remount department. It is scarcely necessary to add that the German veterinary surgeon, for education and intelligence, is scarcely to be equalled, and his position in the army entitles him to have his science and his services suitably and promptly recognised. This being the case, and knowing that he is a prominent member of the remount commission, we need not be surprised that the quality and condition of the German cavalry horses during the late wars, even under the most adverse circumstances, were the wonder and admiration of more than one English military correspondent, and that the losses from disease and preventible accidents should be almost reduced to a minimum.

It would appear to some people that an army veterinary surgeon's duty in this country is merely to cure disease and examine horses as to soundness; and they are incapable of understanding, or are unwilling to admit, that his services should be utilised in preventing disease, and in taking care that horses are not admitted into the service whose conformation, besides rendering them comparatively worthless, even for light duty, predisposes them to serious maladies. In selecting remount horses, a knowledge of anatomy and physiology is necessary, and a special application of these to the study of conformation is most essential. Fancy an army surgeon, in examining a recruit, being ordered to certify only to his actual freedom from present disease, and forbidden to express an opinion as to the physical defects which none but an educated eye can detect: this being left for some chance amateur who knew nothing of the matter! What kind of army should we have in a year or two? and how much would it be worth in the field?

These remarks have been elicited by a retrospective view of recent events; by the knowledge, derived from personal observation, that our army is far from being so well horsed and prepared for war in the equine department as it should be; and that our present arrangements for remounting, while terribly expensive during war, would only provide us with animals which, in a very brief space, would add to a heavy sick list, or disappear altogether in the first few weeks of a campaign. But I must confess that they have been more especially elicited by an excellent article in *Colburn's United Service Magazine* for August last on "Prussian Army Horses," written by a gentleman who stands high as an authority on military subjects, and who did me the honour to request my aid in pointing out the desirability of establishing an *Annual Veterinary Statistical Report of the Army*, on the plan of the *Army Medical Statistical Report*, the import-

ance of which is now so generally recognised, both in the service and by the public generally. In the letter in which he calls my attention to the above-mentioned article, he says (for I cannot do more, nor yet better, than quote what he has to urge in favour of Veterinary Army Statistics): "It is nearly forty years since the importance of statistical information relating to the army was urged in the same journal by the late Colonel Sir A. Tullock and Dr. Henry Marshall; and much of the success of the scheme may, I think, be fairly attributed to the persistency with which the subject was pressed on the notice of the combatant portion of the profession by the *United Servive Magazine*, at a time when statistics generally were held to be a fair subject for the small wittlings of the general press. I, of course, have no knowledge of the subject; but during a good many years of Colonial service—seven of them on the Cape frontier and in Natal, I was often painfully impressed with the waste of animal life and public money which appeared to be accepted by the combatant portion of the officers generally—many of them of far greater experience than myself—as unavoidable and of trifling moment. . . . I cannot help thinking that in many places, in India more especially, statistical information would point very clearly to ways of combining increased economy of life and money, with increased efficiency in the mounted branches of the army."

In addition to calling attention to this extract, I can now refer to the perhaps more direct manner in which he alludes to this matter in the course of his paper, which is headed "Prussian Army Horses, 1845-70; with some Observations upon Veterinary Statistics."

The article contains so much that possesses the highest interest for the army veterinary surgeon, that an apology for inserting it in our professional journal seems scarcely warranted. At any rate, as we have no army veterinary periodical like our Continental colleagues, there is no other channel open to us for the ventilation and discussion of such subjects, which, in many respects, are thoroughly professional, and have the additional claim of being of national importance.

For the account of the horses of the German army during the period immediately antecedent to the outbreak of the late war, reference has been chiefly made to a little work entitled *Die Remontirung der Preussischen Armee*,* published at Berlin about twelve months ago, and which contains most interesting information regarding the measures adopted by the

* 'Die Remontirung der Preussischen Armee,' von C. O. Mentzel, Remonte Depot-Directeur.

Prussian Government for the encouragement of a breed of horses adapted to military purposes.

Though, since the late war, great changes have occurred in the distribution, and to some extent in the organisation of the German army, yet there can be no doubt that a system of remounting which has answered so well will not only be retained, but still further perfected. Indeed, the improvement of their breeds of horses is an object of constant solicitude by that wise and far-seeing government. Since the war it may be interesting to note, before commencing with the subject of the paper, that the establishment of the German army has been fixed at 693 veterinary surgeons, and 94,742 horses; of the latter 69,161 belong to the cavalry, 15,163 to the artillery, and 2,274 to the military train.

The benefits supposed to attend the Prussian system of remounting, by the most competent authorities who have attended to its working, are:—1. That it supplies the army with good, serviceable horses. 2. That the outlay thus incurred is not greater than would be necessary if the horses were imported from abroad, and that the money so laid out is spent at home. 3. That the prices given for the remounts are less than their actual value. 4. That the encouragement thus given to horse-breeding is of considerable importance in a national and commercial point of view. 5. That the army is rendered independent of foreign markets for the supply of its horses. It is further added, that the working of the system has also been attended by an enormous increase of numbers in this description of stock in Prussia, and by a marked improvement in the quality of the horses employed for agricultural purposes.

The army remounts, of which the number annually required was about 5,000 during the latter years of the twenty-five years' period, 1845—69, were purchased in the open market by five Standing Remount Committees, to each of which a special district was assigned. Two (one of them being an auxiliary committee) took East Prussia and Lithuania; one was for the country between the Vistula and the Oder; another for the country between the Oder and the Elbe, Schleswig-Holstein included; and the last, for the districts between the Elbe and the Rhine.

There are very marked differences in the horse-producing resources of the various districts, and also in the quality and description of animals they supply. Into these matters we shall not enter, but proceed to notice certain attributes which necessarily are common to the whole body of army horses.

And, first, as regards age, size, colour, and sex.

Age.—The horses are bought at the age of three and a half years; that is to say, they are, for the most part, foaled in January—March, and are purchased in the summer and autumn of their third year. They are then kept for a period of twelve months in one of the remount depôts, of which there are twelve in different parts of the country, during which time they are carefully ridden and handled, and finally, at the age of four and a half years, they are transferred to their respective destinations. The horses of the Life Guards, and Guard Artillery, and officers' chargers of the Line, Artillery and Riding Establishment, remain another twelve-month at the remount depôts.

The average ages of Prussian Army horses are given thus:

1856.—Cuirassiers, ten and a half years. Uhlans, ten one-third. Hussars, ten one-third. Artillery, nine one-quarter. Train, twelve one-twelfth years.

1864.—Cuirassiers, nine three quarters. Uhlans, ten one-twelfth. Hussars, nine eight-twelfths. Artillery, nine. Train, eight seven-twelfths.

1869.—Cuirassiers, ten one-twelfth. Uhlans, nine seven-twelfths. Hussars, nine six-twelfths. Artillery, eight eight-twelfths. Train, ten years.

The average age during the twenty-five years' period aforesaid was about nine years, and, as will be observed, it was less during the later part of the time. The comparatively short time which army horses last in our own service has more than once been made the subject of comment. It certainly well deserves more careful attention than it has yet received.

Size.—The lowest heights at which horses are admissible to different branches of the Prussian Army were fixed, by a Cabinet Order of 1854, as follows:—Cuirassier regiments, fifteen hands one inch. Hussars and Light Dragoons, fourteen and a half. Uhlans, fifteen. Artillery wheel-horses, fifteen and a half. Ditto lead-horses, fifteen hands one inch. Ditto riding-horses, fourteen hands three inches.

The average height of the horses in the ranks and at the remount-depôts, in 1868, was fifteen hands two and three quarter inches. The standard was highest in the Cuirassier regiments, sixteen hands one inch; and lowest in the Hussars and Light Dragoons, fifteen hands one inch.

Now, from the horse-rolls of Wichmann's regiment, at present the 4th Prussian Hussars, for September, 1750, we find that of 1110 horses then on the strength of the regiment,

953 being geldings, and the rest mares—the average height was fourteen hands. The tallest horse stood fifteen hands one inch, and the shortest twelve and a half hands. Taking Wichmann's horses as a fair type of the hussar cattle of their day, it would appear that the standard of German hussar horses, which was raised an inch or two after Waterloo, is now more than a hand higher than in the days of the Seven Years' War. Even the smallest horse at present admissable in the hussars is half an inch higher than the average of Wichmann's horses.

Colour.—Remounts are purchased without reference to colour, but greys, piebalds, and other conspicuous colours have hitherto been rejected in the Cuirassier regiments; and in the artillery, greys are taken for the grey teams only.*

Sex.—The proportion of the sexes amongst the remounts varies considerably in different years. The average of 78,000 remounts in the twenty-five years' period, 1845—69, was as follows:

Cuirassiers	76·4	per cent.	geldings	23·6	mares.
Hussars, &c.	48	„	„	52	„
Uhlans	59·2	„	„	48·8	„
Artillery	61·9	„	„	38·1	„

The proportion of mares was much above the average in 1849, 1851, to 1854, and during the years subsequent to 1863. It is a great deal influenced by the state of the markets.

The next point discussed in the work before us—and it is a very important and interesting point—is the wear and tear of army horses. Here a distinction is made between—

1. The *Stammpferden*,† or horses on the strength, which are again divided into *old* and *new stammpferden*, the latter being the remounts of the same and of the preceding season.

2. The *Augmentations-pferden*, viz. the horses taken on in the event of a mobilization, to supply extra horses for staff and regimental officers, bât and baggage-waggon horses, additional draught-horses for the artillery and train, for which purposes great numbers are needed, horses for the pontoon and bridge trains, for the field-post, field-telegraph, and railway equipment, and, generally, for the various administrative branches of an army in the field.

* Grey and white horses in an army are a mistake, particularly in the cavalry and artillery; they are more conspicuous than other colours, and require more grooming to keep them fairly presentable.—G. F.

† So called, we presume, in reference to the Stammroll or Regimental Register.

The augmentation-horses are nearly all from the rural districts; the towns and manufacturing establishments, it is observed, supply but few. Obviously, the same care cannot be taken in their selection, and they lack the gradual training to their new mode of life which other army horses receive. As a consequence, the casualties are heavier amongst them than among the stamm horses, more especially at the commencement of a campaign.

The casualties from all sources, in the cavalry, field artillery, and train, during the campaigns of 1866, are shown as hereunder. For brevity's sake, we omit some of the least important data.

Cavalry.—The total number of cavalry horses which took the field at the commencement of operations was 34,833, viz. officers' chargers and riding-horses, 3585; stamm-horses (old) 20,292; ditto (remounts purchased in 1864) 2561; ditto (remounts purchased in 1865) 1554; augmentation-horses 6841. To these were added, by drafts from the reserves during the operations, 1043 chargers and stamm-horses including remounts, and 1969 augmentation-horses; making a total of 37,845 cavalry horses of all descriptions. This number was reduced in the course of operations as follows:—

By Death in Action, 935.—Excluding the drafts received during the campaign, the proportion of casualties under this head in each class was 1·3 amongst the officers' horses; 2·7 amongst the stamm-horses; 3·0 and 2·8 amongst the remounts; and 3·2 amongst the augmentation-horses.

By other Casualties in Action, 258.—The percentage in each class being lowest, 0·4, amongst the officers' horses, and highest, 1·0, amongst the remounts of 1865.

By Deaths occurring in the Course of the Operations, but not caused in Action, 1321.—Excluding the drafts as above, the proportion of casualties of this class was 2·2 per cent. amongst the officers' horses; 2·7 amongst the stamm-horses; 2·2 and 3·2 amongst the remounts of 1864-65 respectively; and 8·6 amongst the augmentation-horses.

By other Casualties not arising in Action, 731: the class percentage being lowest, 1·3, amongst the stamm-horses; and highest, 4·4, amongst the augmentation-horses.

Field Artillery.—The number of horses which took the field was 33,481, viz. officers' chargers and riding-horses, 1119; stamm-horses, 4675; ditto (remounts purchased in 1864), 544; ditto (remounts purchased in 1865), 623; augmentation-horses, 26,520. To these were added, in the course of operations, drafts numbering 107 chargers and stamm-

horses, and 3999 augmentation-horses, making 37,587 horses of all descriptions. The casualties were,

By Death in Action, 525.—The percentage in each class was, officers' horses, 1·8; stamm-horses, 3·4; ditto (remounts of 1864) 3·5; ditto (1865) 3·7; augmentation horses, 1·1.

By other Casualties in Action, 78. — Class percentage: officers' horses and stamm-horse remounts of 1864, *nil;* stamm-horses, 0·5; augmentation-horses, 0·2.

By Deaths not caused in Action, 1744.—Class percentage: officers' horses, 2·4; stamm-horses, 3·4; remounts of 1864, 4·0; ditto, 1865, 4·7; augmentation-horses, 5·7.

By other Casualties not arising in Action, 777.—Class percentage: officers' horses, 2·2; stamm-horses, 1.4; remounts of 1864, 2·4; ditto, 1865, 3·2; augmentation-horses, 2·5.

Train Battalions.—The number of horses which took the field amounted to 14·056, of which 937 were officers' horses; 575 stamm-horses; 13 remounts ditto; and 12,531 augmentation-horses; to which were added, in the course of the operations, 270 officers' horses and 3326 augmentation-horses, making 17,652 in all. The casualties were as below :—

By Deaths in Action, 3 augmentation-horses only.

By other Casualties in Action, 23, ditto.

By Deaths not caused in Action, 822.—Class percentage: officers' horses, 4·0; stamm-horses, 3·3; remounts, *nil;* augmentation-horses, 6·1.

By other Casualties not arising in Action, 536.—Class percentage: officers' horses, 4·3; stamm-horses, 1·2; remounts, *nil;* augmentation-horses, 3·9.

Out of a grand total of 82,370 horses, neglecting the drafts, we have, therefore,

In action . .	Deaths . .	1·8	per cent.
„ . .	Other Casualties	0·4	„
Not in action .	Deaths . .	4·7	„
„ .	Other Casualties	2·5	„

In respect of *breeding*, it is admitted that the regimental and other data are insufficient to furnish any positive conclusions. So far as facts can be ascertained, they confirm the belief popularly entertained in the army in favour of a strong infusion of noble blood. When not counterbalanced by over sensitiveness, or delicacy of the digestive organs, certain attributes of the thoroughbred horse—such as an active circulation, good muscle, tense sinews, good feet—are specially appropriate to the army horse, and, on the other hand, are wanting to a greater or less extent in underbred horses. From the care taken in the selection of remounts, it may

fairly be inferred that blood was more plentiful amongst the stamm-horses than amongst the augmentation-horses, and that the greater immunity from injuries and sickness, which the former appear from the above statistics to have enjoyed, may be to some extent attributable to that cause. At any rate, the author assures us that, when it was possible to procure information upon the subject, it was invariably found that the horses carrying the "crown brand," showing them to be the produce of one of the Government studs (*Haupts Gestuts*), or whose descent could be traced from some of the thoroughbred stallions (*landeshauptbeschallions*) which the liberality and untiring efforts of the Prussian Government have provided in considerable numbers in various parts of the country, kept their condition best in the field, and were distinguished by their cleverness and powers of endurance.

Extracts from the regimental reports on the horses of the several army corps during the campaigns of 1866 are annexed, from which we quote two remarkable examples. The first was related by Count Bismark-Bohlen, in his *Vortrage über die Aufgaben und die Verwendung der Reiterei im Kreige* (Berlin: Mittler and Son). It is as follows:—

"Lieutenant Von Sperber, of the 1st (Lithuanian) Dragoons, marched with his section on a reconnaissance from Liebau by Pilnikau to Eisenbrot and back to Kottwitz, a distance of twenty (German) miles as the crow flies, in forty-two hours; between Pilniken, Eisenbrot, and Kottwitz, where it was very heavy ground, seventeen miles occupied twenty-four hours, and two of the horses fell lame. Not a horse was left behind, and all were present in front in the action at Konnigratz." The distance here mentioned would be equal to eighty English miles in a direct line, without allowing for deviations.

In the *Norddeutschen Landwirthschaftlichen Zeitung*, of 11th September, 1869, No. 73, it is stated that every horse of this party bore the crown brand.

The other instance is that of the 12th (Thuringian) Hussars, who, in 1866, were mounted on Prussian horses in which the barb strain was more observable than in those of any other corps. This regiment had marched, without a rest, from the Elbe to the Danube, came into bivouac at 2.30 a.m. on the morning of the 3rd July, and received half rations, and at 3.30 p.m. the same day made an attack over half a German mile (two miles English) of ground, winding up with a pursuit of some six hundred paces, without having a single horse out of the line.

As regards the annual mortality of Prussian army horses,

we find that the average of the twenty-five year period 1845-69, was 2·6 per cent., or twenty-six deaths in every thousand horses per year. This average is raised by the losses in the field in 1864 (the Schleswig-Holstein War), and in 1866 being included in it. In ordinary peace time the mortality during the period aforesaid would seem to have ranged thirteen to twenty deaths per thousand horses per annum.

At the Remount Dêpots, in the period 1835-44, the losses are shown as follows :

By glanders	0·57 per cent.
By influenza	0·53 „
By other maladies . . .	1·51 „
Total . .	2·61 „

During the period 1845-69 they were—

By glanders and farcy . .	0·3 per cent.
By strangles and catarrh .	0·6 „
By influenza	1·5 „
By other maladies . . .	1·0 „
Total . .	2·5

The mortality at the Remount-Depôts was least in 1849, when it was sixteen per thousand ; and greatest in 1855, when it reached forty-seven per thousand. Glanders was then more fatal than during any other year of the period, carrying off eighty out of 3349 remounts. No cases of this disease appeared in 1866. In 1867, strangles and catarrhal affections destroyed seventy-six out of 4886 remounts, the highest number on record. Influenza was most fatal in the depôts in 1860, causing sixty deaths among 3927 young horses, and least so in 1859, when there were only three fatal cases among 3450 remounts. The number of deaths from influenza was considerably above the average in the years 1845-47, 1853-55, and 1860-62 ; and much below it in 1852-54, in 1859, and 1866.

We have been tempted to pursue this portion of our subject with some minuteness of detail in the hope of drawing attention to the want of such statistics in our own Services. Even in the brief form in which they are given in the little work now before us they have their use. Why should we not have an Army Veterinary, as well as an Army Medical Blue Book? Apart from its importance to science as a contribution of carefully observed data bearing upon the conditions of health and disease amongst domesticated animals—and we have high authority for saying that such data would possess very great

scientific value—an annual report of this description would, from a professional point of view, beyond doubt suggest retrenchments quite compatible with an increased efficiency of those invaluable but costly elements of our army, its mounted branches.

Returning to the subject of Prussian Army Horses, we find some particulars respecting the costs of remounts, which are at variance with the idea popularly entertained amongst us that the German army is horsed at a far less cost than our own. Of the relative quality of the horses in the two armies we offer no opinion.

The precise cost of remounts during the twenty-five year period 1845-69, varied much in different years and in different districts. The average was lowest in 1847, when it was about £15, and highest in 1869, when it was about £25 per horse.

In the latter year, the average prices given for different descriptions of remounts were as follows: For the Cuirassiers £27 (178 thalers); for the Uhlans, £23 (152 thalers); for the Dragoons and Hussars, £20 (152 thalers); for the Artillery, £21 (143 thalers).

But, as the remounts are kept for a twelvemonth before they are placed in the ranks, we must add to the above prices the cost of their keep at the Remount-Depôt during that period. This sum appears to have varied greatly during different years and at different depôts. The average of all the Remount-Depôts for the year 1860 shows the cost of keep, including share of working expenses of depôt, to amount to 56 thalers, 11s.gr., or about eight guineas per horse for twelve months. Adding this sum to the prime cost we have the following as the actual value of the remounts in the several branches of the service, when placed in the ranks, viz. Cuirassiers, £35; Uhlans, £31; Hussars, £28; Artillery, £29; mean average of whole army, £31 per horse.

Assuming, for the sake of comparison, that the market prices of the animals are the same in Germany and England, if, for the exceptionally small charge of eight guineas for twelve months' keep, we substitute £28, which, we suppose, may be taken to represent the average charge for the same in our service, we get as the approximate English value of the Prussian remounts during the year 1869 £55 apiece for those of the Cuirassier regiments, and fifty guineas apiece for those of the army taken all round.* Unsuitable horses, the Germans know right well, are dear at any price.

* Though the Prussian horse may appear to be so expensive by the time

As regards the casting of horses in the Prussian army, there appears little to note. As in our own service a large number are seemingly cast at a comparatively early age, but no information is given as to the predominating causes of casting. This, as before remarked in these pages, is a point upon which information is sadly needed in our own service. During the period 1845—69, the number cast annually varied greatly. In the last ten years of the period the numbers were as follows:

1860 . . .	4,152	1865 . .	4,711
1861 . . .	3,491	1866 . .	42,517
1862 . . .	5,219	1867 . .	23,756
1863 . . .	2,849	1868 . .	8,017
1864 . . .	1,617	1869 . .	4,294

The average sum realised in the twenty-five years was about £10 a head. It was lowest in 1848, £3 10s.; and highest in 1859, when 40,000 cast horses were sold, fetching on an average £13 apiece.

In conclusion we give the rates of forage allowed to army horses in Prussia, and the weights carried by them.

According to a regulation of 13th May, 1858, the rations for army horses were prescribed as under.

The horses are divided into three classes:

1. Those receiving a heavy ration. In this class are general and staff officers' chargers; commanding officers' chargers and troop horses in the guard artillery; horses of officers of the war department and riding establishment; horses of Cuirassier regiments; of the regiments of Landwehr heavy cavalry; of the Lieb-gendarmerie; of the Intendance; and draught horses belonging to the Artillery and Train.

2. Those entitled to a medium ration. All horses of the Line and Landwehr Uhlan regiments; and of the squadrons of the Landwehr battalions of Reserve regiments.

3. Those drawing a light ration. In this class are included all descriptions of military horses not specified above.

Since the date of the above order the army ration has been increased (in 1867) by a half pound of oats per diem in all classes. It now stands thus:

	In Garrison.		
Heavy ration .	9½ lbs. oats;	5 lbs. hay;	7 lbs. straw.
Medium „ .	8¾ lbs. „	5 lbs. „	7 lbs. „
Light „ .	8 lbs. „	5 lbs. „	7 lbs. „

it enters the ranks, yet there can be no doubt it is not really so; for the animal is well grown and likely to stand more hard work than the English trooper, which is put in the ranks generally a year earlier.—G. F.

In the Field and on the March.

Heavy ration	10½ lbs. oats;	3 lbs. hay;	3½ lbs. straw.
Medium „	9¾ lbs. „	3 lbs. „	3½ lbs. „
Light „	9 lbs. „	3 lbs. „	3½ lbs. „

When the rations are issued in oats only, the foregoing amounts are increased by three and a half, three and a quarter, and three pounds of oats respectively.

When carried by railway or on board a transport, each horse receives an additional ration of three pounds of hay and two pounds of straw for each trip of eight hours or less duration, with an extra three pounds of hay when the journey is of longer continuance. In field manœuvres extending over a period exceeding four weeks, the horses of the Cuirassier and Landwehr heavy cavalry regiments, and the draught horses of the artillery and train receive a ration of

11¼ lbs. oats; 3 lbs. hay; 3½ lbs. straw,

and those of the rest of the Line and Landwehr cavalry, and of the squadrons of Landwehr battalions, and the riding horses of the Artillery,

10 lbs. oats; 3 lbs. hay; 3½ lbs. straw.

Other horses, including the chargers of general and staff officers, do not receive extra rations under these circumstances.

The average cost of keep is not stated.

The weights ridden in the mounted corps of the German army are at present as follows: Cuirassiers, twenty stone two and a half pounds; Uhlans, eighteen stone half a pound; Dragoons, seventeen stone three pounds; Hussars, fifteen stone five pounds. These are the weights in the Guard, in marching order, and English weight. In the rest of the army, the men are smaller on the average, and the weights ridden are consequently less.

In Sir Henry James' 'Equipment of Cavalry' (1870), the weights ridden in our own service, in marching order, are given as below:

Household Cavalry	20 stone 11 lbs.
Dragoons	19 „ 6 lbs.
Lancers	19 „ 0 lbs.
Hussars	19 „ 1½ lbs.

THE ETIQUETTE OF VETERINARY AUTHORSHIP.

A Letter from Professor Williams, Edinburgh, in reply to Mr. Fleming.

Mr. Fleming, in a letter published in your last number, has seen fit to refer to the 'Principles and Practice of Veterinary Surgery,' recently published by me, and seems to think that I have treated him unfairly in what he calls my chapter on "Shoeing." Singularly enough, Mr. Fleming does not appear to have read the work itself, but to have obtained his information from what he calls "several independent sources," for he not only makes this assertion at the commencement, but in an after part of his letter he says, "If the facts are as my correspondents state, it is evident I have some reason to complain."

The correct course which Mr. Fleming should have taken before rushing into print with a complaint would surely have been to have read the book, and not trusted to statements of correspondents, or his so-called "independent sources."

But let us see what Mr. Fleming has to complain of. In the *first* place, he says "Mr. Williams repeats substantially, "if not literally, in some parts a portion of what has been "written by me on this subject in my work on 'Horse-Shoers "and Horse-Shoeing,' published more than three years ago; "and again in my essay on 'Practical Horse-Shoeing,' to "which the first prize was awarded by the Scottish Society for "Prevention of Cruelty to Animals, and which was published "at the commencement of the present year.

"It would also appear that in the course of his remarks "Professor Williams does not offer the slightest indication of "the source from which he derived his ideas. Neither does it "seem that there is anything offered on this subject beyond "what is found in the two above-mentioned works.

"It is only at the conclusion of the chapter that he "acknowledges having borrowed materials for its construc-"tion from an unpublished essay by Mr. Broad, of Bath, and "which obtained the second prize from the Society on the "same occasion as that on which I had the honour to obtain "the first."

In the *second* place, Mr. Fleming accuses me of having adopted Mr. Thacker's shoe without acknowledgment.

It is a very easy matter to bring forward charges of unfairness on such a subject as horse-shoeing. Mr. Fleming can scarcely imagine or expect the public to believe that the works he has written on this subject contain nothing but

what is original. He must know that the great mass of our information is at least professional, if not even public property, and that it is unreasonable for any author to claim credit for what belongs to all—unless, indeed, Mr. Fleming means to say, that no one is entitled to write on horse-shoeing but himself, and that no one, professional or otherwise, is to be allowed to publish his ideas upon the subject and to bring out distinctions without being liable to a charge of plagiarism, which seems to be what Mr. Fleming's complaint points to.

Mr. Fleming not only accuses me in general terms of abstracting his ideas, but even of giving "literally" portions of his works. Like most members of the profession, I am quite familiar with Mr. Fleming's writings on horse-shoeing, and am of opinion that he has given a very full and accurate account of what has been written on the subject up to the date of his publications, but I am nevertheless not aware that they contain any original matter.

As to the *second* accusation, that I have adopted Mr. Thacker's shoe without acknowledgment, I may state that, until I saw Mr. Fleming's letter, I had forgotten there was a shoe termed Thacker's shoe, although I had read the manuscript of Mr. Fleming's essay in 1870. Since, however, my attention has been drawn to it by Mr. Fleming's letter, I have read his printed description of this shoe, and examined the plates in pages 76 and 77 of his essay on 'Practical Horse-Shoeing,' but have failed to recognise its identity with mine; indeed, the one is as different as possible from the other. My shoe is simply a tooled concave ground-surface shoe, with narrower heels than ordinary, fullered and holed in the ordinary way, with the exception that the fullering is not carried to the end of the heel. Mr. Thacker's shoe is also concave on the ground surface and narrow at the heels, but very wide in the web at the toe, which is turned up (Frenchified). It also has a clip at each side of the toe, four nails only, and those stamped in the middle of the web of the shoe, so that unless the foot were good and strong it would be dangerous to put such a shoe on. Mr. Thacker's shoe is, in fact, a modified French shoe, and a very bad modification for general purposes; but further, the shoe is not originally Mr. Thacker's, and if the reader will refer to Mr. Fleming's essay, page 77, he will find the concluding portion of his description of the Thacker shoe to be as follows:—"It may be mentioned that, with the exception of "the two side clips at the toe, this shoe is nearly identical in "shape with that recommended by Col. Fitzwygram in his

"excellent work on 'Shoeing.'" And if sufficiently interested to pursue the subject further, he may consult Col. Fitzwygram's work on 'Shoeing,' p. 35, and will there find that the shoe he recommends is one brought out by the late Mr. Hallen, V.S. So much, then, for the originality of Mr. Thacker's shoe.

It is evident that Mr. Fleming is wroth that I have alluded to Mr. Broad, who only gained the second prize, whilst Mr. Fleming obtained the first; but if he had looked at my work he would have seen, that I acknowledge, that my views are borne out by many practical men, under which he might have included himself had he wished. I referred more particularly to Mr. Broad, because I know for a fact that that gentleman advocated sole pressure so long ago as 1838, and I consider his 'Second Prize Essay' to be the most practical and original I ever read; but I repudiate the insinuation that I borrowed materials from Mr. Broad's essay beyond what I have acknowledged. I am in a position to state that Mr. Broad differs from me upon the matter of narrow heels.

When acting as adjudicator for the Scottish Society for the Prevention of Cruelty to Animals, during the autumn of 1870, I read forty-two essays on 'Horse-Shoeing,' some of them covering over 300 pages of manuscript. Does Mr. Fleming suppose that he alone out of the forty-two essayists advocated the concave shoe, sole pressure, non-paring of the foot, or all and every idea upon an enlightened system of horse-shoeing?

I may further state that I arrived at my conclusions as to the desirability of the shoe recommended by me, not only from what I had read upon the subject and my own independent anatomical investigations and experience, but from what I thought defective in the "Charlier shoe;" and if any one is sufficiently curious and interested in the matter, he will find, upon an examination of my plates of it, that is a combination of the "Charlier and the hunting shoe," a Charlier shoe at the heels, the old hunting shoe at the sides and toe.

I can only say that it has been my endeavour, not only in what Mr. Fleming calls "the chapter" (which is scarcely four pages), but in all other parts of my book, to give the credit due to those from whom I have received original information.

I am much indebted to Mr. Fleming for his kind congratulations upon my appearance as an author, and beg to assure him that, should occasion arise, I shall be very happy to acknowledge any assistance which I may receive from his writings.

While agreeing with Mr. Fleming as to the desirability of attending to all essential points of etiquette in regard to authorship, I must remind him that it is also necessary to discourage ill-founded claims of this sort, and that they ought neither to be made on the one hand nor recognised on the other without good foundation.

BURSATIE.

By Robert Spooner Hart, M.R.C.V.S., Calcutta.

(*Continued from p.* 715.)

It will be observed that the three forms of ulcers met with in "Bursatie" correspond with each other, in so far that they all commence as tumours under the skin, and subsequently ulcerate. The position of the circular ulcers, I am of opinion, in some way influences their development; for when they occur on the neck they show little or no tendency to assume the papillated form, but remain scabbed, and increase only at the base. The scab seems to consist of detritus and dried discharges, and on being removed leaves an angry bleeding surface exposed. The ulcer in appearance resembles a chancre of immense size, and shows no tendency to heal. The tumours are but slightly developed under the circular ulcers, in comparison, at least, with those under the medium ulcers, and they are still less prominent under the latter than under the phagedænic ulcers. I have seen all three forms of ulcers existing at the same time in one subject, but only in exceptional instances. The papillated ulcers are very frequently multiple, whilst the medium and phagedænic are generally single. It is not unusual to see one medium ulcer and a papillated one, or one of the latter and one of the phagedænic variety, in existence at the same time, or they may follow each other in alternation. But whilst the circular ulcers are formed more frequently in the earlier stages of the malady, the medium and phagedænic mark the latter stages. The act of sloughing, which plays such a fatal part in the latter stages of Bursatie, is not peculiar to this disease. I have seen the same thing occur in melanosis, where the tumour and skin covering it have sloughed out, leaving a large ragged cavity, and I have further observed that this disease, like Bursatie, is most liable to occur during the two months which precede the rains, namely, May and June. (*Vide*

Erichsen, p. 384.) Doubtless occasionally scirrhous masses slough out, leaving a large ragged cavity, which may cicatrize, and thus result in a spontaneous cure, but in the case of melanosis and Bursatie I have never yet seen a cure effected in this way. The most extraordinary feature in connection with Bursatie is the tendency to assume totally different forms in different subjects.

In one subject it may, for a long time, produce no more visible effect upon the constitution than would a benign growth, whilst in a second, the disease may appear and pursue a malignant form, and prove fatal in the course of three or four years. The phagedænic form of the disease is the most virulent, and I have never yet seen an animal in this stage of the malady in good condition; in fact, in most instances the diseased are completely anæmiated and worn-out animals, although in the earlier recurrences fair condition may be maintained by the attacked. But the growths becoming more malignant and severe in the later than in the earlier attacks, their recurring very much quicker, and the ulcerative process becoming more rapid, render the decline of health most marked.

Associated with and accompanying the formation of the tumours there will be staring coat, pallid membranes, and short cough. Sometimes diarrhœa is present, and at other times constipation; fæcal matter always offensive. There may be also anorexia or, on the other hand, bulimia. The symptoms will be all more or less marked, according to the rapidity with which the disease runs its course; but whilst the symptoms which have been referred to are liable to vary, there is one invariably present, that is, æsthenic inflammation of the mucous membranes of the nose and eyes. The Schneiderian membrane has a leaden hue, and there is a discharge from it of watery mucus. The conjunctiva is of a dirty purple colour, while the secretion consists of flocculi of lymph with pus, of a dirty grey colour. The eyelids are swollen, hot, tender, irritable, and project out from the eyeball, which appears to remain free. This state is, as a rule, only well marked in one eye; if the near eye is very bad, the off eye will only be slightly affected, and *vice versâ*. I have heard it remarked by the natives, when seeing the eyes in this state, that the malady has attacked the eyes, and there is some truth in the remark, for I have observed that when a large ulcer exists, the eye symptoms are less marked. Then, when the ulcers are healing, animals affected with Bursatie may, in consequence of a morbidly ravenous appetite, take a large quantity of food, but to no purpose; the in-

creasing emaciation keeps pace with the formation of the tumours and their ulcerative condition. I have seen, in a few bad cases, acute inflammation of the lymphatic glands of either hind or fore legs, producing for a time pain, heat, swelling, and lameness, but disappearing in the course of three or four days, only to recur. The lymphatic glands never become permanently indurated, and I assert that in "Bursatie" we have no true gland implication, although the lymphatic glands do occasionally, in bad cases, become acutely inflamed. In two instances in which I saw inflammation of the lymphatic glands, the disease afterwards terminated in "farcy," which at once gave evidence that the *materies morbi* of that affection had originated in the system, had led to the œdematous swellings, and then ultimately caused the glandular derangements.

The Diagnosis of "Bursatie."—Bursatic sores may be confounded with unhealthy sores and ulcers arising from other causes.

In consequence of the decided character of the disease an amateur may in a short time acquire such diagnostic tact as to enable him to speak with almost certainty on Bursatic ulceration; the only time when a dispute is possible is at the onset of the malady, when a simple sore is said to have taken on "Bursatic action."

It may often occur that a surgeon is consulted with reference to a sore on the fetlock of a favourite hack, which on examination proves to be of a "Bursatic nature," the primary simple sore having taken on this action.

The owner, should he put faith in the diagnosis, will, in all probability, wish to dispose of the animal; but should he doubt this a second veterinary surgeon's opinion is obtained by him, which opinion is frequently contrary to that which had been given. So far so good; but I fear, in many cases, opinions are given with self-interested motives. "Bursatic ulceration," or a simple sore which has taken on the "Bursatic action," may be recognised by the appearance, on the surface of the sore, of a dark red, jelly-like exudation, by the formation of an indurated base, by the surrounding parts becoming nude of hair, hot, painful, tender, and irritable. Besides the presence of the indurated base, the ulcer will be circular and elevated from the surface; it may or may not be scabbed; if so the scab will be thick, and the outer surface be dark brown and the under dirty grey in colour. This peculiar detritus scab, conjointly with the presence of a hard base, constitute the essential characters of the non-papillated "Bursatic chancre." The circular papil-

lated ulcers may be recognised by their projecting, knob-like, from the legs, with papillated surface, and everted, hardened, undermined edges.

The medium ulcers, which occur singly, are generally seen on the body; they are of large size and possess hard bases. They may occur with one of the other variety, with edges livid and hard; they may or may not be scabbed. Scabs, when they exist, are very thin; the surface is covered with pale, flabby granulations. The attempt at repair around the margin is characteristic of the medium ulcer. The phagedænic ulcer leaves a ragged cavity, is non-papillated; surface generally covered with a thin scab, lightly attached; edges everted, thickened, and undermined.

Always examine the legs particularly for old cicatrices. If the horse is an old "bursatied" subject the scars will quickly let the secret out. "Bursatied" subjects are very unsatisfactory workers, being frequently in hospital for treatment of ulcers situated on the shoulders, or parts in actual contact with the harness. The ulcers often occur in quick succession, and render the animal very unsightly, for as soon as you destroy the surface of one sore, and the exudative matter becomes checked and a healthy aspect apparent, you only need examine your patient carefully to find another. I have experienced this over and over again. The ulcers which occur on the body are rarely seen posterior to the thorax, and it occurs to me that my worst cases have been among aged mares, rather than among geldings or stallions. The disease is wonderfully rife amongst horses that are badly cared for; for instance, those used in the native hackney carriages, the majority of which are ponies (vulgarly styled Indian Arabs). These poor beasts perform an incredible amount of hard work under the hottest sun, and are fed almost entirely on green-grass, yet they are capable of performing physical labour that would prove fatal to many a pair of upstanding horses, and it is among the first class of animals that the disease shows forth in its true colours. You can very rarely pass a hackney stand or stable without seeing several of these ponies with large scabbed ulcers exuding a dirty fluid, which, running down the face, renders the profile nude of hair; and here they stand suffering intolerable pain and exposed to the continual annoyance of flies and the exhaustive effects of a "tropical climate." The natives seldom do anything to alleviate the sufferings of these unsightly victims so long as they are enabled to get one leg in front of the other on the road, and when worn out from hard work and disease they are turned loose in the streets to wander about, and ulti-

mately die of starvation. The same course is pursued by them with their horses and ponies when affected with glanders and farcy, and the owners of horses must often regret that the law here permits proceedings of so infamous a nature to be carried on in broad daylight without punishment.

(*To be continued.*)

THE PRINCIPLES OF BOTANY.

By Professor James Buckman, F.G.S., F.L.S., &c. &c.

(*Continued from p.* 819.)

Passing over the Garryads as containing a small list of, to us, unimportant plants, we now direct attention to the menispermal alliance, of which the following is the diagnosis:

Menispermales.—*Declinous exogens, with monodichlamydeous flowers, superior disunited carpels, and an embryo surrounded by abundant albumen.*

This alliance contains, according to Lindley, six natural orders, including an extended list of genera and species; we shall, however, only direct attention to the two following:

Myristaceæ—*Nutmegs.*

Menispermaceæ—*Menispermads.*

Professor Lindley places the nutmegs in the alliance to which we have referred it, remarking as follows:—"It seems impossible to disjoin nutmegs from the menispermal alliance, because of their strictly unisexual flowers; the diverging cotyledons of their embryo bring them up to Monimiads, while the ruminated albumen finds its parallel in the genus Anomospermum in Menispermads."—*Veg. Kingdom,* p. 301.

It is this "ruminated albumen" which forms the oval-shaped nutmeg, which is brown and wrinkled externally, and internally marked with black and whitish veins.

The whole mass of this seed is highly aromatic, and forms the well-known spice to which the name of nutmeg has been given. At the same time we must notice the expansion of the funiculus, to which the name aril or arrillode has been given. This, too, is a spice differing much in flavour and appearance from the nutmeg, and is known under the name of mace. It is of a brightish colour, and forms, as it were, a

frill, only partially covering the nutmeg by reason of its jagged ends.

We have an analogue of this structure in the fruit of the spindle-tree (*Enonymus Europæus*), common to our hedges. In this the aril is of a still brighter orange colour than that of the mace, but it is wholly without aroma.

The occurrence of two such different spices as nutmegs and mace in close contiguity is in itself remarkable; but it was no uncommon belief that somehow cloves were first obtained from the nutmeg-tree, of which cinnamon was said to be the bark.

The nutmeg-tree grows to a considerable size, attaining nearly thirty feet in height. Its alternated lanceolate leaves are aromatic, and, indeed, a different sort of aroma is common to each organ of the plant.

"*Myristica moschata* and *M. officinalis* is cultivated in the Molucca Islands, Java, Sumatra, Bengal, &c. It is a tree of from twenty to twenty-five feet in height, with oblong aromatic leaves and fruit, very much like a peach, having a longitudinal groove on one side, and bursting into two pieces, when the enclosed seed, covered by a false aril or arillode which constitutes the substance known as mace, is exposed.

The seed itself has a thick, hard, outer shell, which may be removed when dry, and which encloses the nucleus of the seed, the nutmeg of the shops. The nutmeg consists of the albumen or perisperm, with the embryo at one end, and is covered by a thin membrane, which adheres closely to its surface, and projects into the substance of the albumen, thereby giving it the mottled appearance for which it is so remarkable.

"At one time the culture of nutmegs was almost entirely in the hands of the Dutch, who took every means to monopolise the growth of the plants, in which they were in a measure defeated by a kind of pigeon, which—extracting the nutmeg from its pulpy covering—digests the mace and voids the nutmeg uninjured. It is related that the Dutch used to burn nutmegs when the crops were too abundant, in order to keep up high prices. Old ladies in the country, to this day, keep a nutmeg in their pocket, as was customary in their younger days, when the effects of the war with France and of the Dutch monopoly rendered all spices very expensive."

We have extracted the above from the 'Treasury of Botany,' as it is, perhaps, the most recent article on the subject.

Relating to the dearness of nutmegs, it may not be out of

place to state that, though they are much cheaper than they used to be, much chicanery is still practised with regard to them. It is a common practice to extract the greater part of their essential oil, called oil of nutmeg, and then to dry and dress up the nut as fresh; and from the article just quoted we learn that "The French are said to have various ingenious methods of dressing up inferior nutmegs to resemble good ones, and even to fabricate artificial nutmegs of bran, clay, and powder of nutmegs." And Sam Slick accuses the Yankees of making wooden nutmegs.

Pereira tells us that three sorts, both of nutmegs and mace, are known in the market as

Penang,
Dutch or Batavian,
Singapore,

} Nutmegs or mace, as the case may be.

As an evidence of the quantities of these spices which are imported into this country, we quote the following as their annual importation from 1844 to 1850 inclusive, a period of seven years:

	Mace in lbs.	Nutmegs in lbs.
1844	33,898	152,110
1845	35,551	444,706
1846	33,104	405,679
1847	60,265	367,936
1848	47,572	336,420
1849	45,978	224,021
1850	76,365	312,418

These figures show a great increase in seven years, and there is reason to suppose that within the last twenty years this has not fallen off.

The principal uses of these spices will, of course, be found in domestic economics. They enter into the composition of the mince pie and the Christmas pudding, and are no less celebrated for their flavour in our Christmas cups; and as the joyous season is again so near, we are tempted to extract the following from "Spring-Tide," by our esteemed friend the Saxon antiquary, Mr. J. Y. Akerman:

"The Parlour of the 'Angler's Rest.'

"SENEX and JULIAN.

"*Enter* Hostess, *with a loving cup.*

"*Senex.* There, take a draught of what our hostess has brewed for us, and tell me what you think of it.

"*Julian* (after a protracted 'pull' at the tankard). Ha!

this is indeed a drink for a prince. You must tell me the secret of its confection.

"*S.* That you shall know presently; but say, is it not an excellent draught for a thirsty and somewhat wearied man?

"*J.* Not only meat and drink, but clothes, lodging, and washing to boot, as Paddy has it. Most cool and delicious. But I long to know the secret of its brewing, for mine hostess was very quick in preparing it.

"*S.* It is made thus:—Take two glasses of sherry, two table-spoonfuls of moist sugar, a quarter of a nutmeg, and a sprinkle of ginger;* fill up with a pint of *mild* ale over a piece of well baked (but not burnt) toast. These are the proportions; and if you will make it with a quart of ale, you, of course, double the quantity of wine, &c. Any wine will answer the purpose, but if of two kinds the better. It should stand a quarter of an hour before it is drunk, that the flavour of the sop may be duly imparted to it."

Let us hope that our veterinary friends will favour this use of these spices, although they do not employ them in their remedial practice, or, at least, they find no place in the 'Veterinary Pharmacopœia.' Both these spices are employed considerably in the human school principally as aromatics. A notable example will be found in the fine cordial known as *Confectio aromatica.* It is said to be narcotic in larger doses, and thus Pereira says, "In mild cases of diarrhœa I have frequently employed nutmeg as a substitute for opium. It may be taken in warm brandy-and-water, unless the use of spirit be contraindicated."

These spices and wine, then, may properly be taken for "one's stomach's sake, and one's oft infirmities." For whether used as a condiment, or as a medicine, they may aid the digestive process, while imparting an agreeable flavour.

The *Memispermaceæ,* like the former, are remarkable for the possession of active properties. Thus, in the seeds of the well-known *Cocculus indicus,* we have a dangerous poison, the effects of which upon fish are well known and acted upon —a scoundrelly act of poaching.

The *Cocculus palmatus* affords the Calumba root, which, as stated by Dr. Lindley, in the 'Flora Medica,' "is a valuable and excellent tonic, having aromatic qualities, but mucilaginous, and not acting as a stimulant. It has the power of checking sympathetic vomiting in female pregnancy, diseases of the kidney, &c. It is also used with advantage in

* We prefer the addition of a small quantity of mace.—J. B.

the latter stages of dysentery, in habitual diarrhœa, and in a languid state of the stomach."

Pereira says, "it is of all tonics the least likely to disagree with the stomach."

This, again, has no place in the 'Veterinary Pharmacopœia,' though from its esteemed qualities and the fact of its abundance and comparative inexpensiveness it would seem to be well adapted as a remedial agent in many of the complaints of the lower animals.

TWISTED NECK OF THE UTERUS OF A COW, FOLLOWED BY SPEEDY DEATH.

By J. H. Bennett, M.R.C.V.S., Havering, Essex.

On August 23rd I was called to a cow, one of the herd that had been suffering from foot-and-mouth disease, but which had passed favorably through the attack, in consequence of her exhibiting symptoms of acute abdominal pain. On examination I found that she was near the period of parturition, and that the pains were somewhat allied to those of labour, but unaccompanied with any dilation of the os uteri. The pulse was quick and tremulous, the breathing rapid, and the surface of the body bedewed with perspiration; the fæces and also the urine were frequently voided during her painful expulsatory efforts. Thinking that the calf was probably dead, and that in due course the os uteri would be dilated, I administered diffusible stimulants with the idea of supporting the animal and assisting in the expulsion of the calf. During the evening of the same day I saw the animal again and found that there was little change in the symptoms, except that the pulse had become rather more distinct, but the eyes were more sunken than in the morning and the distress and general indications of suffering more marked. Restoratives were again had recourse to.

On the morning of the 24th the cow was much worse, almost pulseless and evidently dying. She died during the forenoon without any further evidence of the calf coming away.

On making *post-mortem* examination I found the uterus to be much congested, its vessels turgid with blood, and its coats thickened to a great extent; but what in my opinion was a very singular thing was that a complete twist had taken place

in the neck of the uterus, so that the uterus must, "calf and all," have turned quite over in the abdomen. Whether this state of things arose from the cow rolling or from any other cause I cannot say, but from the appearance of the uterus I should think that the mischief had existed for perhaps about forty-eight hours. This, however, is only a supposition. No doubt the strangulation would lead very quickly to the complete congestion of the vessels of the womb and to the speedy death of the calf.

CASE OF VOLVULUS IN A HORSE.

By John Howard, Veterinary Student, Manchester.

On the evening of the 26th, of August last a bay cart-horse, the property of a gentleman of this city, was brought to the veterinary infirmary of Messrs. Lawson and Son, to all appearance suffering from colic, which had shown itself shortly after his return from the day's labour.

Symptoms on admission.—Pulse normal; visible mucous membranes of the ordinary colour; anxious look, expressive of great pain; pawing and scraping, looking towards flanks, crouching, lying down with great caution, and when down rolling on his back.

Treatment.—At first, an ordinary stimulant was given, but without relief. In an hour afterwards a draught composed of Spts. Æth. Nit. f℥ij, and Spts. Ammon. Aromat. f℥j, Tr. Opii f℥j, was administered, and the rectum explored, which, however, was found empty. Temperature normal.

After the administration of the medicine the pain became much more intense, and the animal stretched forward his neck and vomited through his nostrils the whole of the medicine which had been given. A mustard embrocation was now applied to the abdomen, and an enema of warm soap and water thrown up the rectum. Shortly afterwards the animal took Aloes Barb. ℥v in a ball, and was bled to the extent of four quarts. Antispasmodics, anodynes and glysters were also given at regular intervals during the whole of the night.

The following morning, as the bowels had not acted, Ol. Lini Oj, with Ol. Tereb. f℥j, was administered, and subsequently, during the day, Aloes Barb. ℥ij. By the evening the symptoms were much changed; the pulse had risen to 80 per minute, and was of a wiry character; the mouth was hot, dry, and sticky; the breath fetid; nose,

ears, and extremities cold. The rectum was found empty, and the mucous membrane dry. On the hand being passed onwards the animal groaned with pain, and seemed to strain with all his strength as if to force an evacuation. The visible mucous membranes were still of the normal colour, and no tympanitis visible. I now felt positive that some mechanical obstruction existed. The Ol. Lini, Ol. Tereb., and Tr. Opii were repeated in the same doses as before. Towards midnight the animal became affected with alternate spasmodic twitchings of the muscles of the fore extremities, which were occasionally so violent that I thought he would have lost his footing and fallen to the ground.

During the first half of the night two ten-drop doses of Aconite were given, and the sinapism repeated. This was followed by the application of hot fomentations to the abdomen, but without relief, as from the first he had not enjoyed a moment's respite from the most agonizing pain. I now injected under the skin Morph. Acet. grs. iij, and gave the following draught, Ol. Lini, Chloroformi f℥ij, Tr. Opii ℥ij, Ol. Tereb. f℥j. This relieved him from all pain for about two hours, during which time he stood perfectly calm and placid. At the end of this time, however, the symptoms reappeared in all their intensity. He became delirious, and at intervals would neigh as though he heard pleasurable sounds; at others he would prick his ears, snort, and tremble as if in the most deadly fear of approaching danger. Occasionally he ground and gnashed his teeth, his eyes rolling in their orbits in frenzied anguish. The body was bathed in cold perspiration, pulse smaller and over 100 in frequency.

Having determined to relinquish all further treatment, at 5 a.m. on the 28th I gave him his last dose, consisting of Calomel ℥ss, Pulv. Opii ℥j, et Camph. ℥jss. At 8 a.m. he seemed free from pain, but the pulse was running down, and the superficial parts of the body were cold and clammy. No feculent matter nor urine had been passed from the beginning. I now thought that gangrene set in; the animal had a dejected cadaverous look (*facies hypocratica*) and occasionally looked about as if seeking for something, but for what he did not know.

At 11 a.m. he fell down in a state of *syncope*. All thought him dead, as he lay motionless, and to all outward perception breathless and insensible. In about a quarter of an hour he revived, rose to his feet, and vomited through his nostrils all the medicine which had been given him, largely admixed with bile. This continued for some minutes.

Shortly afterwards he fell to the ground and expired, just forty hours from the commencement of the attack.

The *post-mortem* examination disclosed a double twist of the ileum, immediately below its juncture with the cæcum. All the rest of the organs were perfectly healthy. The strangulated part of the bowel was sphacelated.

I have seen several cases of volvulus in which the visible mucous membranes were not injected throughout the disease, so that I am beginning to think that this may be a distinctive feature betwixt it and true enteritis or peritonitis.

'NOTE.—The Ol. Lini was given with chloroform and opium, so that the anæsthetic action of the chloroform might be more slowly developed and its action prolonged. The desired result was fully gained in this case (*i. e.* a long period of ease from pain).

OSSIFICATION OF THE TRACHEA, A RESULT OF TRACHEOTOMY.

By the Same.

ABOUT the end of December last a dark brown cart horse was treated by Messrs. Lawson and Son for laryngitis. Asphyxia being threatened tracheotomy was performed, and in due time the animal recovered and returned to work. In three months after this the driver complained that the horse experienced great difficulty in respiration during labour, which led to the site of the operation being examined, when it was found to be slightly thickened; an incision was made through the skin to relieve the tension, and a blister afterwards applied to the part.

After the lapse of another month the dyspnœa became much worse, when it was found that ossification of the part, with much thickening, had taken place. By means of a small surgical saw a piece of solid bone, two and a half inches long by three fourths of an inch broad, was cut from the place of the first incision in the windpipe, and a tube inserted. Much relief followed the operation.

At the expiration of two months the opening was again allowed to close, and the horse was put to light work, which he performed satisfactorily for a short time. On one occasion, however, being taken to pull some heavily-laden boats,

he exhibited great difficulty in breathing, which was accompanied by a roaring sound so loud that the driver became alarmed and immediately took him back to his stable.

In a few days after this occurrence he was harnessed once more for work, and was about to be led out of the stable-yard, when he suddenly fell, and, after a brief struggle, expired.

Unfortunately the knacker neglected to preserve the trachea, as desired, and thus we were deprived of the opportunity of ascertaining the precise condition of the tube.

I have given this brief outline of the case because I consider it one of a very unusual character; indeed, one not mentioned, so far as I am aware, in any pathological work we are possessed of. Probably the gradual thickening of the trachea led to an insufficient supply of oxygen, so that the animal suffered from a similar change in the blood to that which is witnessed in cyanosis, and thus was produced the sudden death by asphyxia.

Pathological Contributions.

THE CONTAGIOUS DISEASES (ANIMALS) ACT, 1869.

"RETURN of the Number of Foreign Animals brought by Sea to Ports in Great Britain, which on inspection on landing, within the Month of October, 1872, have been found to be affected with any Contagious or Infectious Disease, specifying the Disease, and the Ports from which, and to which, such Animals were brought, and the mode in which such Animals have been disposed of.

Foreign ports from which brought.	Ports in Great Britain to which brought.	Disease.	Number of Animals affected.					Disposal.
			Cattle.	Sheep.	Goats.	Swine.	Total.	Slaughtered at place of landing.
Bremerhafen . .	Hull . .	Foot-and-Mouth	1	3	...	...	4	4
Cherbourg	Southampton . .	„	...	...	...	32	32	32
Coruña .	Portsmouth .	„	3	...	...	...	3	3
Hamburg .	Hartlepool	„	4	5	...	...	9	9
„	Hull . .	„	21	3	...	2	26	26
„	„	Sheep-scab .	...	4	...	...	4	4
„	London .	Foot-and-Mouth	16	212	...	5	233	233
„	Middlesborough	„	16	7	...	...	23	23
„	Newcastle-on-Tyne	„	8	1	...	...	9	9
Honfleur .	Southampton . .	„	3	...	...	...	3	3
Husum .	London .	„	49	80	...	...	129	129
Nordenham . .	Hull . .	„	1	...	...	...	1	1
Tonning .	London .	„	417	167	...	...	584	584
Total . . .		Foot-and-Mouth	539	478	...	39	1056	1056
		Sheep-scab .	...	4	...	...	4	4
Total			539	482	...	39	1060	1060

"Privy Council Office, "ALEXANDER WILLIAMS,
"Veterinary Department, 14th November, 1872." Secretary.

CATTLE PLAGUE.

An inquiry has just been concluded in the recently infected districts of the East Riding of Yorkshire with satisfactory results.

At Patrington, where the disease first appeared, no fresh case has occurred for more than two months. The fields have been top-dressed with lime, the sheds thoroughly disinfected,

and fresh stock been brought on to the premises where cattle plague had existed.

The Bridlington district has also been declared free, and cattle have been grazing for some weeks in the fields where the diseased animals were slaughtered and buried.

In the Pocklington district, where cattle plague was detected on August 27th, and continued, in spite of the measures which were employed to eradicate it, for nearly two months, no fresh case has occurred for nearly six weeks, and it may be fairly concluded that the district is now quit of the disease.

The cattle plague order, which was issued on September 7th, ceases to operate on December 1st, and will not, under the circumstances above described, be renewed.

With regard to our observations last month on the incorrect statements which several of our contemporaries had persisted in promulgating, respecting the disposal of some of the imported cargoes of cattle plague animals, we have had our attention directed to the following remarks in the *Durham Chronicle* of October 25th:

"An Expensive Funeral.—A correspondent draws "attention to an item in the chief constable's report, pub- "lished in the *Chronicle* of last week, showing that the inter- "ment and disinfection of twenty-six cattle-plague beasts at "West Hartlepool had cost the county £72 19*s*., or £2 16*s*. 1*d*. "per beast. Our correspondent asks whether it was absolutely "essential that the obsequies of the defunct bovines should "have been carried out on so expensive a scale, and points "out that the carcases might have been destroyed by fire for "a very much smaller sum. As the matter stands, the "undertaker's bill seems to have been rather a large one."

Cattle plague still occupies an extensive field in Central and Eastern Europe. From Vienna we learn that the malady exists in various districts in Hungary.

At least forty communes in Hungary are infected. Bohemia, Galicia, and Moravia have also many centres of infection.

The disease is also prevalent in Sclavonia and Dalmatia, but the Turkish authorities take but little notice of it, and hence it is found to be very difficult to enforce precautions. The situation is considered to be serious, which we take to mean the disease runs its course unchecked.

Cattle plague also prevails in Russo-Poland, at Grossen, and in various places in the of Goverment of Warsaw.

More than a month ago an outbreak of cattle plague

occurred at a village near Trieste, and the disease continues to exist in that neighbourhood.

At Scutari the malady manifests no tendency to diminution, either of its virulence or extent of prevalence.

Hamburgh was declared free in the latter part of October, and all the restrictions on the movement of stock have been abolished.

PLEURO-PNEUMONIA.

For some months past pleuro-pneumonia has been on the increase, according to the returns, which do not, however, convey any adequate idea of the prevalence of the disease in large towns.

Manchester and Sheffield are among the large towns in which pleuro-pneumonia is on the increase.

At present forty counties in England and nearly twenty in Scotland are infected with the malady, and the number of diseased animals amounts to over three hundred.

FOOT-AND-MOUTH DISEASE.

There has been a sensible decline in the severity of the attacks of this disease, and in many cases a considerable decrease in the number of fresh cases; it is yet, however, too early to suggest that the malady has exhausted its force.

In several districts abroad foot-and-mouth disease continues to prevail, chiefly in Schleswig-Holstein, from which place large numbers of diseased animals have been sent to the port of London. Cattle and sheep affected with the malady have also been imported from France, Spain, and Denmark.

In this country fresh outbreaks among deer have been reported; and in several instances, in the western counties, the early lambs of Dorset and allied breeds are said to have died, in a large proportion, from the ewes, at the time of parturition, being affected with foot-and-mouth disease.

INFLUENZA IN HORSES.

From inquiries we have made, and also from our experience, we can state that there are some indications of the influenza, which has been so remarkably prevalent among the horses in Canada and the United States, assuming rather severe proportions in some parts of our own country. During the past month many cases of the disease have come under our immediate notice; but in none have the symptoms assumed an alarming aspect, and the animals have, consequently, under proper medical treatment, soon become convalescent. Nevertheless the occurrence of an increased number of cases just now has an importance not otherwise attaching to periodic attacks of this equine disease.

In Sheffield and its neighbourhood very many horses are disabled from attacks of influenza.

Facts and Observations.

Medical Microscopical Society.—At the preliminary meeting of the proposed Medical Microscopical Society, held at St. Bartholomew's Hospital, on Friday, November 1st, the chairman, W. Morrant Baker, Esq., F.R.C.S., &c., made a few introductory remarks, and then called upon Mr. J. W. Groves to give the reasons for the formation of such a Society, and the objects which were had in view for it when formed. Mr. Groves proceeded to state these briefly, and then read extracts from some of the communications on the subject with which he had been favoured by Drs. Carpenter, Burdon-Sanderson, Lionel Beale, and Rutherford; Messrs. R. Brudenell Carter, E. Ray Lankester, and others. Then followed a brisk discussion, in which Drs. Lawson, Heywood Smith, Frank Payne, and Woodman, Messrs. Jabez Hogg, T. C. White, B. T. Lowne, E. C. Baker, and others took part. It was ultimately decided that the Society should exist, and a provisional committee, composed of the Honorary Secretaries of the Royal Microscopical Society and the Quekett Microscopical Club, besides representatives from each of the London hospitals, was elected. The next meeting, for sanctioning rules, electing officers, &c., will be held in the College Hall, St. Bartholomew's Hospstal, on December 6th

(that is, the first Friday in December), at eight o'clock p.m. —*The Week.*

Chemical Composition of Pus.—The *British Medical Journal* states, in a recent number (May 28, 1872), that Hoppe-Seyler has obtained results which are interesting in reference to the question of the origin of the pus-corpuscles and their identity with the colourless and lymph corpuscles. He introduced fresh crystalline lenses of the ox into the abdominal cavity of dogs, and analysed them after a period varying from one to fourteen days. As was expected, the lenses became infiltrated with lymph corpuscles. Glycogen was found in greatest abundance at the eighth day, at which period they contained the greatest number of contractile corpuscles. The glycogen is due to these corpuscles. If the lenses were not plunged immediately into boiling water, but allowed to stand for some time, no glycogen was found, but in its place sugar. In the pus of congestion abscesses, no glycogen occurred. The occurrence of glycogen, therefore, may be taken as a means of distinguishing lymph from pus-corpuscles. When glycogen is found in abscesses, it will be found to coexist with the presence of numerous contractile corpuscles. Lymph corpuscles, therefore, by their transformation into rigid pus corpuscles, become deprived of their glycogen.—*The Popular Science Review.*

Is there Alternation of Generations in Fungi?—Mr. M. C. Cook, M.A., believes that it is questionable whether this phenomena occurs in fungi, as Professor Œrsted alleges. He thinks it takes place in the same plant, as in the case of *Bunt;* but he feels great difficulty in believing in this process, where the generations were passed in different plants, until confirmed by other observers. If the spores of *Æcidium Berberidis* were taken from the barberry and sown upon young wheat plants, and all these plants became infected with corn mildew (*Puccinia graminis*), to which wheat is but too prone, it certainly seemed premature to say that the spores of the *Æcidium* caused the *Puccinia* to be developed as a second generation; whereas it is much more probable that the germs of the mildew already lay dormant in the wheat, and, at most, the sowing and growing of the *Æcidium* spores only stimulated the mildew to a more rapid development.—*Ibid.*

The Breathing Pores of Leaves.—A good popular paper on this subject is that which Professor T. D. Biscoe read before the Troy Scientific Association, and published in the *American Naturalist*, March, 1872. If, he says, the

outer layer or skin be stripped from the surface of the green-coloured parts of plants, and examined under a low power of the microscope, the stomata, or breathing pores, will appear as green specks in the otherwise colourless membrane. Their object is to open and close communication between the intercellular space always existing between the individual cells and the outer atmosphere. The sausage-shaped cells constituting the essential part of the organ are called the pore cells. They have the power of separating from each other in the middle, thus opening a free way for the air to the interior tissues; or in certain conditions of light and moisture they approach each other so as to narrow or entirely close the slit between them. They are filled with protoplasm, chorophyl and starch granules, while all other cells of the outer surface are filled only with air and water. Apparently with the object of placing these pore cells as free as possible from all constraint or pressure, so that they may correspond sensitively to all the changes in the atmosphere, they are at times situated on a level with the epidermis cells, sometimes raised above, at others sunk beneath this level. If the epidermis cell-walls are thin and flexible, the stomata will generally be found in the same surface with them; but when the epidermis walls are thick and stiff, the stomata will generally be found sunk deep under the surface, or raised above it, or surrounded by a ring of smaller cells with thinner walls than the remaining epidermis cells. Immediately under the stomata are empty spaces, of irregular form and varying size, called breathing-rooms. They are in connection with, and form a part of the intercellular space which ramifies through the entire structure of most tissues. It is an interesting question in what way the stomata have been formed. Were the pore cells at first a pair of ordinary cells, which have gradually changed their form and contents until endowed with all the peculiar properties of their natural state? Or were they always existent in their peculiarities, only smaller as the leaf was younger? Or have they grown out of a single cell by the process of subdivision and after-growth? Do they belong to the epidermis, or to the chlorophyl-bearing tissues beneath?—*Ibid.*

THE VETERINARIAN, DECEMBER 2, 1872.

Ne quid falsi dicere audeat, ne quid veri non audeat.—CICERO.

CATTLE PLAGUE IN YORKSHIRE.

SINCE the 25th of October the East Riding of Yorkshire has remained free from cattle plague. Fresh stock has taken the place of that which was destroyed by the disease or the poleaxe, and we may hope that we have seen the last of the unwelcome visitant. Two months from the time of the discovery of the disease elapsed before it was finally extinguished—not a very long time; and we might feel disposed to congratulate the country on the favorable result of the precautions which have been adopted were it not for an uneasy conviction that a very slight alteration in the conditions which existed in the infected localities might have led to a wide diffusion of the contagium in spite of the exercise of the powers conferred on local authorities by the Contagious Diseases (Animals) Act. Slaughter of animals which were herded with or had been in contact with diseased ones failed to arrest the progress of the disease, more frequently than it succeeded, in the three infected districts of Patrington, Bridlington, and Pocklington, chiefly because the disease was not detected until the infection had extended to herds in the neighbouring provinces; and had any of these infected but apparently healthy animals been sent to the country markets, or to any other market or fair, as they might have been, it is more easy to imagine, than define, the extent of the mischief which must have followed.

When the nature of the disease was discovered and the movement of cattle only permitted under certain restrictions, the danger was materially lessened but not altogether removed, as in two instances the disease appeared more than two miles from a centre of infection, having been conveyed in one instance it is believed by a dog, and in another by a man who had attended sick cattle. The sale and distribution of either or both of these herds might have been quite innocently effected before any signs of disease were appa-

rent, and the plague have been carried to any part of the kingdom.

Such possibilities may be contemplated calmly now that their realisation is not apprehended, but so long as they were possibilities they were by no means satisfactory subjects for reflection. The stamping-out system, as it is now arranged by the Act, was first successful at Patrington; that is to say, the slaughter of all the cattle of infectious herds, as each herd became in turn infected, arrested the disease in a short time essentially because all the herds within reach of the infection were attacked and destroyed; cattle were few in this district, and those few were divided into small lots of two, three, and four. Consequently the loss sustained was slight.

At Bridlington the cattle were more numerous and the herds larger, and there also the disease spread from one pasture to the next; the slaughter of cattle which had been herded with diseased ones was only carried out at intervals and in certain cases, and the disease, consequently, lingered longer than at Patrington. Pocklington district had the largest cattle population, and although the measures attempted there by the local authorities were generally more stringent than those employed in the other districts, the disease kept ahead of the repressive means for some time, and ultimately extended to a distance of five miles from the original centre. The one unsatisfactory phase in the history of the cattle plague at Pocklington is the fact that its spread was due to the preservation of three small herds, including a total of some twenty cattle which were pastured in three sides of the field in which the animals belonging to Mr. Berriman were attacked. No law existed under which the destruction of the three herds could be insisted on; and, unhappily for the district, there was no one to act on the plea of necessity which has no law.

This single error being condoned, it is impossible to speak too highly of the energy which the local authorities displayed in stamping out the malady wherever it appeared; and while we cannot avoid the conviction that the whole results might have been better, we are quite ready to admit that they might have been very much worse.

Extracts from British and Foreign Journals.

SANITARY POLICE AND THE CATTLE PLAGUE.

By M. Bouley.

(Translated from the 'Comptes rendus hebdomadaires des Séances de l'Académie des Sciences,' vol. lxxiv, No. 18, April 29, 1872, pp. 1154-1165.—H. M. J.)

An international Sanitary Conference was held at Vienna on the 16th March last, at the suggestion of the Austro-Hungarian Government, to propose a code of regulations for a uniform sanitary police. By adopting uniform measures both for preventing the introduction of cattle plague, as well as for arresting its propagation, there need be no interruption of the ordinary commercial relations between the signitaries of the Convention, even if, notwithstanding the preventive measures adopted, the cattle plague were introduced into one district or another of the different countries.

Eleven States were represented at the Conference by twenty-six delegates, namely, Germany, Austro-Hungary, Belgium, France, Great Britain, Italy, the Roumanian Principalities, Russia, Servia, Switzerland, and Turkey. Of the delegates fifteen belonged to the veterinary profession, and eleven were administrative functionaries attached to the sanitary service of their respective countries, and well qualified to pronounce an opinion on the propositions which required to be submitted to their judgment.

The questions on which the Conference had been summoned to deliberate were no fewer than sixty-five in number, and several others were added at the request of the representatives themselves. One remarkable circumstance deserves to be mentioned at the outset, as it differs completely from the ordinary rule in such cases, namely, that, notwithstanding the large number of members of the Conference, and of the questions to be considered, the decisions formulated in their 'Report on the Principles which should serve as the Basis of International Regulations against the Cattle Plague' were adopted unanimously, with the exception of two cases of secondary importance, on which the agreement was not so complete.

This perfect accord, which is by no means customary in matters relating to medical science, is a consequence of the fact that there now exists no divergence of opinion as to the foreign nature of the cattle plague in reference to Central and

Western Europe, nor as to the mode in which it is propagated. We are now thoroughly convinced that outside the Russian empire it is never developed spontaneously, no matter what may be the breed of cattle, not excepting even that of the Steppes. Consequently, whenever cattle plague appears elsewhere, it is because it has been imported by some means or another. We also know equally well that, when it remains for a longer or shorter time in a country that it has invaded, it is kept up solely by means of contagion, that it cannot be perpetuated otherwise, and that it becomes extinct when it can no longer be communicated to other animals. It is, therefore, necessary to repeat, contrary to the opinion of some physicians, that the cattle plague cannot become an indigenous malady in our country, under the influence of what is somewhat obscurely termed an epidemic nature. A hundred and twenty years ago it persisted in England for thirteen years consecutively, because it was not known how to get rid of it; but the phantom of epidemicity is not slow to vanish when it is decided to attack the contagion and to annul its effects.

The same fact was reproduced in the same country in the year 1866, and in a manner still more flagrant. When, in that year, the cattle plague was imported through the channels of commerce, people persisted in ignoring its origin, and in considering it an indigenous disease developed by the exceptional heat of the season. Under the impression of this false idea they refused, for three long months, to apply the sanitary measures, the certain efficacy of which had been attested by the experience of the Continent. Thus England and Scotland suffered immense losses. But when, finally, the error was recognised, and Parliament had passed a Bill which empowered the English authorities to slaughter, in the cause of the public interest, animals which could convey the contagion, or enlarge the focus of the disease, then—and this is a thing apparently very remarkable, and by no means common in the annals of medical science—the epizootic disease, which was in its full destructive activity, was not slow in disappearing, as if it were at the express command of the Government.

Contagion is thus the exclusive cause of the importation, the propagation, and the greater or less permanence of the cattle plague in Western and Central Europe.

From this conclusion, so certain and so incontestable, proceeded all the sanitary measures which the International Conference decided upon, and the adoption of which they proposed to the governments of all the countries that are

naturally exempt from the cattle plague, and which suffer from it only by accident.

But if it is certain that this disease never develops itself spontaneously beyond the frontiers of the Russian empire, ought all the provinces of that empire be equally suspected, and subject to the same interdiction? This is a question which it would have been very important to solve in the interests of commerce, but the elements necessary to the solution of it were not in the possession of the Conference. It is presumable, from the facts that the representatives of Russia made known, that in the western provinces of the empire the cattle plague is produced only by contagion, as in other parts of Europe; and that it is in the Asiatic territories that the conditions for its spontaneous development are found; but this is merely a presumption. It is, moreover, certain that the movement of beasts from the Ural Mountains towards the western frontiers of the empire too commonly disseminate the germs of the contagion in the country that they traverse. Russia has, therefore, been, until the establishment of new laws, necessarily left out of the Sanitary Convention which it was desired to establish; and that country should not be allowed to export its cattle except under certain more or less efficacious guarantees, of which I shall speak presently.

The danger of the cattle plague is an incessant menace to Europe, as Russia has not yet attempted to defend its western provinces from its ravages. Could it not be neutralised by a general inoculation, rendered compulsory through the whole region of the Steppes? But the Steppes are of immense extent, and they are stocked with herds that may well be termed innumerable. Under such conditions is inoculation really practicable? At first sight it would appear that this question can be answered only in the negative. However, the objection as to its impossibility falls to the ground in face of the fact that the majority of the male beasts of the Steppes are oxen, and that, consequently, each of them has individually passed through the hands of the castrator. If castration is possible, then inoculation is equally so. But does its practice yield results of real economical advantage? On this point the opinions of the members of the veterinary profession in Russia continue to be divided, for while some still advocate it others strongly disapprove of it; and after long and costly experiments the Russian Government has renounced it. The results of these experiments give a mean mortality of 13 per cent., even amongst the herds of the Steppes, and this mortality is sometimes increased to 50 per

cent., as was the case in 1860 and 1863 at Orenbourg and Khersoa. The International Conference has, therefore, enunciated the opinion that, in the country where the cattle plague is endemic, there is nothing to authorise inoculation being prescribed as a measure which has been proved to possess real economic advantages.

As to the application of this so-called preventive method to the cattle of Central and Western Europe, the Conference has pronounced the opinion that it must be absolutely repudiated, because it would be too fertile in disasters. In fact, an abstract of the documents relating to the inoculations that have been practised in Central and Western Europe during 120 years gives a mean mortality of 18 to 19 per cent. This would cause at the outset a deliberate loss of 1,900,000 head of cattle in France alone, taking its bovine population to be about 10 millions.[1] But the cattle plague itself, even under conditions so favorable to its spread as those under which it recently invaded our territory, and with means so insufficient to oppose the principle of its propagation, did not cause a loss of more than 35,000 animals, dead and slaughtered. A comparison of these figures will prevent the necessity of any long commentary, as they give of themselves the measure of the practical value of inoculation applied as a preventive measure out of Russia.

It being acknowledged that Russian cattle are more or less certain to contract the plague—either by the fatality of its origin, or, more likely, over a great extent of territory, by the fatality of contagion, to which it is difficult to oppose an efficacious barrier in the actual economic condition of the country—it was not possible[2] to permit the free exportation of Russian beasts. It was, however, discussed by the Conference whether it is necessary to interdict absolutely this exportation, and even this question was answered in the affirmative by the delegates of Germany, the frontiers of which are closed to Russian cattle. In Germany, this regulation is practicable in consequence of the Custom-house service, and the distinctive characters of the Steppe cattle from those of the native races of the German provinces which are adjacent to the Russian frontier. But if, under such conditions, it is possible to prevent the importation of Russian cattle into Germany, this is not the case with the Austro-

[1] The number of cattle of all ages in France, according to the statistics of 1866, was 12,733,188.

[2] These and some other statements should be read with the qualification "in the opinion of the Conference," as distinguished from the practice of the Governments.— EDIT.

Hungarian empire, the frontiers of which, measuring more than 120 leagues, are difficult to close against smugglers, and the Steppes of which are characterised by cattle of the same race as the Steppes of Russia. Moreover, the Russian cattle furnish a considerable number of those required on the markets of the large towns, and for fattening in the great distilleries of Gallicia. Vienna alone consumes more than 80,000 head per annum. In this state of affairs, the Conference was of opinion that it was not possible to close the frontiers of Austria against the importation of cattle from Russia; but that these beasts must not enter without restraint, and that it is necessary to continue to submit them, as heretofore, to a quarantine of ten days before they are allowed to continue their route towards the localities for which they are destined.

I abstain from entering here into any details of the measures which have been proposed with a view to render these quarantines as efficacious as possible, and to submit the imported animals to a rigorous inspection, whether their immediate destination be the slaughter-house or the feeding-byre attached to a distillery. Doubtless these measures cannot give any certain guarantee against the cattle plague, but they must certainly diminish the chances in favour of it, because it is more advantageous for Austria to permit the importation of Russian cattle than to prevent it.

Having once resolved the important question of the commercial relations of Russia with the adjacent countries, the Conference endeavoured to establish the principles which ought to serve as a basis of uniform regulations for all countries in which the cattle plague cannot be introduced, propagated, or maintained otherwise than by contagion.

Thus if, in countries where the cattle plague is only an accident which can be rendered as transient as possible, the guarantee is given by the respective governments that they will adopt against it measures everywhere identical, and the certain efficacy of which, when they are rigorously and scrupulously applied, experience has proved, there will no longer exist any reason for the interruption of commercial relations between those countries, even when the presence of the plague has been detected in one or more of them.

Now, what are the measures, the application of which in a uniform manner can, from the commercial point of view, give this guarantee of impunity to the countries in which the cattle plague has made an accidental invasion, and has appeared in isolated localities?

The following are those which are most essential:—

Immediate slaughter, under rules as to indemnity, of all animals attacked by the plague, and of those suspected in consequence of the influences to which they have been exposed.

Burial of the carcases of all plague-stricken animals, so that no portion can be used for any purpose whatever.

Utilization of the meat of animals killed on suspicion to be allowed under special conditions rigorously determined.

Destruction of the germs of contagion wherever they can be found: in cattle-sheds, manure-heaps, forage, and harness; on the roads, fields, waggons, railway-trucks, &c.; in fact, everywhere and upon everything that can have been exposed to the influence of contagion.

Isolation, as complete as possible, of the places in which the plague has been discovered, in such a manner that no animal susceptible of carrying the contagion can find an exit, and that none can enter capable of receiving it.

This isolation must be prescribed and practised on farms, in localities, parishes, and, in fact, in districts of greater or less extent according to the spread of the plague.

The establishment, round the localities the isolation of which has been prescribed, and which have been declared *infected*, of a zone in which the movement of ruminants is prohibited, as well as the trade in and the transit of everything that may possibly serve as a vehicle for contagion, whether fodder, manure, and animal products and refuse of every kind.

The suspension of fairs and cattle-markets in a certain region round the centres of infection. Enumeration of all the ruminants in the infected locality and the suspected zone, so that the local authority may have a guarantee that animals are not removed clandestinely from the places which they properly occupy.

As soon as a case of cattle plague has been officially proved in a locality, the immediate declaration of every case of any disease to which ruminants are liable to become compulsory on the owners and keepers of those animals.

After the disappearance of the cattle plague from a locality, and after the application of disinfecting measures, very careful precautions to be prescribed in reference to the process of restocking the fields and cattle-sheds, as well as in re-establishing free movement of cattle, and the commercial transactions of which it is the object.

To these measures, which are for the most part of ancient date, and the efficacy of which, when carried out in their

entirety, has been proved by the experience of all ages and all countries, the Conference has added another. This regulation is entirely new and highly important, both from the point of view of commerce and as a sanitary precaution. It consists in the obligation of every State in which the cattle plague may manifest itself to announce immediately, by telegraph, the appearance of the disease, first of all to the Governments of the adjoining countries, and afterwards to those of the States which have expressed their desire to be informed of such outbreaks.

Where the locality infected by the cattle plague is less than 75 kilomètres (45 miles) from the frontier, the authorities of the district to which the locality belongs will have the responsibility of announcing by telegraph the appearance of the disease to the authorities of the adjoining countries.

A minute inquiry will be made as to the channels of introduction and propagation of the disease, and the result of this inquiry will, with the shortest possible delay, be conveyed to the authorities of the countries which seem to be menaced by an invasion of the plague.

Each country where the cattle plague is actually raging will be required to publish in its official journal a weekly statement of the condition of the disease, the measures adopted to restrict its propagation, the successive modifications which circumstances have required in them, and finally the day when they will cease to be in operation.

This statement will be sent to the editors of the official journals of the States which desire to receive it.

These sanitary measures will be productive of the greatest advantages for all countries if they are scrupulously carried out wherever the plague shows itself, because in that case every one will be on his guard against it, viz.: The authorities of the countries the most immediately menaced, in adopting without delay the preventive measures which are recommended in such cases; and the commercial world in abstaining from dealing with the infected localities or districts.

The first idea of these excellent sanitary measures, proposed to the Conference by one of the delegates of Germany, belongs to M. Zundel, an able and unassuming veterinary surgeon of Mulhouse, who published it in the 'Recueil de Médecine vétérinaire.' It is both a duty and a pleasure to give him credit for it here.

The International Conference has not desired to institute a new sanitary regime, for the purpose of preventing the

invasion and impeding the propagation of the cattle plague; but to obtain the adoption of an identical code of rules by all the countries which have combined for this object. The efficacy of these rules is proved by the beneficial results which they have always given, wherever they have been rigorously applied. These results are such that it may be affirmed that this terrible plague, from the ravages of which we have suffered for more than two years, is, however, of all epizootics, the one of which it is most easy to become master under ordinary circumstances, and with a well-organized sanitary staff. This is because, being a stranger to our country, it is not susceptible of taking root there. Arising entirely from contagion, it is only by that means upheld; and when its cause is suppressed it is absolutely certain that it will itself disappear, as is witnessed by all ages and in all places. But if this is so, how is it that we ourselves have so much difficulty in getting rid of it; and that even now, after the lapse of nearly two years since its first appearance, it still rages in certain localities in some of our departments? In the first place, the plague made its appearance in consequence of a combination or disastrous circumstances; and having been imported by means of the commissariat of a foreign army, it was able to extend itself without check over a large extent of country, and was even assisted in its march and extension, by the going and coming of the troops. This result was still further increased by those who made use of the cattle plague as a source of profit, and who, for that purpose, engaged in a speculative traffic, which consisted in purchasing in the infected districts, at a low price, beasts already contaminated, for the purpose of selling them at a higher price in districts where the plague was not then known.

The mischief had already acquired enormous proportions when the central administration of agriculture, having once more become master of its actions, undertook to contend against it. But we do not possess in France a sanitary service organized as it should be, so that all sanitary requirements could be executed as they were deemed necessary, and so that every resistance could be immediately surmounted. In France the difficult task of executing these requirements belongs to the municipal authorities; in Germany this mission is confided to a councillor, who is delegated by the administration, and is assisted by a Veterinary Council. This councillor is invested with powers which give him the right to command the local authorities, and even the military, to assist him in carrying out, to the extent that is necessary,

such regulations as circumstances require to be immediately applied and rigorously maintained. With a sanitary service as well organized, the struggle against the epizootic would be easy, and success would be certain. From time to time, in fact, it has made incursions into the Prussian provinces adjacent to the Russian empire, but the ignited foci have been extinguished as soon as they have been kindled, and an impassable barrier has immediately been opposed to the progress of the contagion.

In France, to obtain the same results as in Germany, it would be necessary to have a sanitary service organized in the same manner, because we ask the municipal authorities to do more than is possible for them in the midst of their place of habitation, with the conditions of their origin, and with the prejudices of their constituency. We must, in fact, avow that we do not always know how to bend to the law, and to accommodate ourselves to its yoke. We have also a much greater tendency to avoid them, when those who are charged to impose them live with us on those intimate terms which weaken authority. Under such conditions, the powers of a sanitary police, which are given to the Maires by the French law, are, it should be remembered, too frequently at least, not placed in hands sufficiently energetic. Here is, therefore, one of the principal causes of the difficulty of application of sanitary measures, as they cannot produce their proper effect, except when they are everywhere carried out in their entirety. One single omission for a single moment, and contagion will find a road open before it; thus it is spread, and thus is lost all the advantage which has been obtained by the efforts to restrain and extinguish it. For instance, when it is forgotten to disinfect a railway-waggon which has conveyed diseased animals, this waggon—a receptacle for the germs of contagion—transmits them to all the ruminants with which it is loaded the next time; and by their intermediary it will disseminate them in passage, even to a long distance. Numerous reports, transmitted to the central administration, carry evidence that, in too many cases, railway waggons which have not been disinfected have served as vehicles for the cattle-plague, and have been the most active instruments of its dissemination.

In Germany all is quite different. The trucks which have been used for the carriage of beasts are submitted to a disinfection before being employed again for the same purpose. Water falls from a raised reservoir, and by its downfall and the force of its flow it detaches and carries away the organic materials adhering to the sides. Besides this it annuls, by

the elevation of its temperature, all the virulent activity in these materials.

I have believed it necessary to enter into these details because the practice of compulsory slaughter, which forms the basis of all the measures which the Conference of Vienna has recommended, is too often regarded as a rude barbarous practice, and, according to some physicians, as the negation of science and art. Also, too large a number of agriculturists, inspired by false ideas, repudiate it in the name of their interests, which they thereby injure, and frequently in the name of their sentiments, with which they thereby clash. Instead of conforming to it as the law requires, they too often have recourse to clandestine modes of treatment, and, when success appears to crown their efforts, they argue from it, by every mode of publicity, to protest against the excess of official measures, and to demand their reform. This is a view which is altogether dangerous. The question is not to ascertain whether the cattle-plague can be cured to a certain extent; it is not even disputed that, even in Europe, a minority of the affected animals, very small compared with the remainder, may escape death. But it is necessary to ask whether the animal that is allowed to live does not itself constitute a public danger, and whether, consequently, the public interest does not exact its destruction in the shortest possible space of time. The answer to this question cannot be doubtful. Incontestably, it is dangerous to allow an animal to live if it is affected with the plague; because each one of the particles of its mass is large enough, if one may use the expression, to infect the whole of a herd, or the whole of a commune, a district, a province, or even an entire continent. Most of the epizootics of plague which have, from time to time, burst forth from the Eastern Steppes upon Europe or Africa have commenced with the infinitely little, and have ended in the infinitely great. The epizootic which entailed the loss of a million head of cattle in Egypt, twenty-five years ago, was imported through the medium of a few beasts belonging to the Roumanian principalities. It was a very small herd, purchased in Esthonia, which infected England in 1866, and inflicted upon that country the enormous damage which it sustained. It was by a dozen oxen, exported from London to Rotterdam, that Holland, infected in its turn at the same period, saw the plague acquire such proportions that it became for that country, the bovine population of which is so condensed, a veritable public calamity. This infinitesmal minority of a dozen oxen entailed the loss of no less than a hundred and fifty thousand head of cattle.

We thus see what history teaches us. It is because all this is known; because we now possess a certain knowledge of the foreign nature of the cattle plague; of its contagious properties, as the exclusive condition of its manifestation beyond its native country; of the activity of its contagion; of the diverse and multiple modes of its propagation and of its expansion; it is because, in fact, we know all the disasters that it inevitably entails when we allow its fire to kindle and increase, that the sacrifice of the smaller number ought to be required to protect and save the greater.

The practice of compulsory slaughter is then essentially rational and scientific, because it has for its foundation the most exact knowledge, acquired by means of history, observation, and experiment.

I venture to hope that the Academy will consider me justified, in consequence of the gravity of existing circumstances, in having arrested for some time its attention on this terrible murrain, which has been, and which still is, a cause of the greatest losses to our agriculture, and which inflicts such grave injuries on the public health.—*Royal Agricultural Society's Journal.*

THE HORSE PLAGUE.

The following is extracted from the *Missouri Democrat*, St. Louis, October 25th.

[From *The Rochester Democrat*, October 18th.]

We hear with regret, but not with surprise, that the malignant disease that has been reported as raging among the horses at Toronto, and which appeared a few days since at Buffalo, has broken out among the horses in this city. Thus far it has confined itself to horses in barns where a considerable number are kept. It is said to be quite prevalent in the stables of the Paper Company at Lower Falls. Some valuable horses used in drawing railroad freights have already died. The disease has not, we believe, yet appeared among the horses of the street-railway company, but when it does we may expect to see a suspension of business in that line as there has been at Toronto.

The *Buffalo Commercial Advertiser*, October 18th, says:

Some days ago an article appeared in these columns an-

nouncing that the horse epidemic, which has prevailed so generally among the horses in Toronto and other Canadian cities, had made its appearance in Buffalo. The disease, which at first was confined to a few animals, is spreading throughout the city. It is reported that nearly all the horses at Niagara Falls are affected with the disease, and that it had extended into the country around that village. It will be remembered that not many months ago a contagious disease broke out among the horses of the metropolis, and raged to such an extent as to seriously retard business; but whether this is the same epidemic or not we are unable to say. The early symptoms of this disease are said to be a light hacking cough and general dulness with an indisposition to move; cold ears and legs, with a watery discharge from the nostrils. At first the nasal membrane is pale, but as the disease advances it becomes highly coloured, and the mucous membrane changes to a greenish or yellow colour, and the pulse becomes more rapid. As soon as these symptoms appear the animal should be kept warm in the stable by blanketing, and warm bran mashes should be given. It should be kept quiet from the first. As diseases of this character usually have their origin in bad treatment and a total disregard of the rules of cleanliness and ventilation, now that it is in the air additional care should be taken to keep the atmosphere in the stables pure and fresh. For this disease to become general among our horses would be a serious calamity, and every means possible should be used to check its spread. If the ravages of the epidemic are as great as they are said to be it would not be out of place for the city officials to give the matter their attention.

Its Spread in Canada.

[From *The Montreal Gazette*, October 19th.]

The horse disease, or, to speak more scientifically, the horse epidemic, since its first appearance in this city, on Friday or Saturday of last week, has spread with such rapidity as to be now general, and the proprietors of the comparatively few horses so far unaffected deem themselves very fortunate indeed. The effects of the epidemic were immediately apparent yesterday in the deserted cab-stands and general Sunday appearance of the streets. Heavy trucks and lighter express waggons made an appearance here and there, but were such exceptions to the rule that the drivers hurried out of sight as quickly as possible, as if both they and their horses were ashamed of not being able to show some symptoms of the prevailing disease.

The number of horses at present sick may be imagined when it is stated that 2000 are under the skilful treatment of Mr. McEachran, the well-known veterinary surgeon. Mr. Swinburne has also more cases on hand than he can possibly find time to attend to, and every horse hospital is crammed. Horses were being brought in all day to the different veterinary stables, and as soon as they were attended to, unless too ill to be taken away, they were led off to make room for others. They were coming in batches from all parts of the surrounding country, thus giving proof that the epidemic is fast making its way through this province as it did the upper one.

In the many large stables of the city the writer visited yesterday it was easy to detect the very sick horse from the one but just affected. The very sick animal, with its head hung down, palpitating sides, and streaming nose, was a very wretched looking object. On every side the sharp, dry cough could be heard from almost every horse. In one large stable, where fifty horses are kept, two yesterday morning were very sick, and all the rest were more or less affected.

Notwithstanding their advertisement, the City Passenger Railway managed to keep their cars running all day, although one veterinary surgeon was loud in his denunciation of such a course of conduct. At any rate the cars ran all day, and it must have taken the best management to keep them going, for last night, as far as could be learned, there were no less than eighty of the company's horses affected. Some of the animals first taken sick, however, showed decided symptoms of improvement, and it was hoped that no case would be worse than an ordinary one. Of the horses in the fire brigade five were sick yesterday, and one or two others looked very much predisposed to the disease. The fact of the brigade horses, so particulariy well stabled, fed, and cared for, taking sick, plainly shows that the epidemic is not confined to one class of horses more than another. How long the disease will last, or where it will end, is hard to say. In the opinion of those who ought to know, it is thought it will not end till a change takes place in the present damp state of the weather. It is likely the disease will take its course throughout the country until checked by a return of fine, dry, clear weather, so characteristic of the Canadian climate. It is a matter of real congratulation that, so far in the progress of the epidemic, there has not been a single fatal case reported.

The Epizootic and How to Treat it.

[From the *Rochester Democrat*, October 23rd.]

The Canadian horse disease first showed itself here to any extent on Friday last. It soon attacked nearly every animal in the livery and horse-car stables, and yesterday we were assured that over 500 animals were suffering from it. One veterinary surgeon alone is treating seventy cases.

The disease has prevailed in the dominion for some past. According to the Buffalo papers it was brought across the Niagara river by the horses of a gentleman who drove over to Queenstown to attend a reception given by the Governor-General. Soon after his return one of the horses was attacked by the epidemic, which in a day or two affected his whole stud. The disease has spread so generally since that from one third to one half of all the horses in Buffalo have suffered from it. We see from the *Lockport Journal* that the disease has within a day or two become prevalent there.

We add a communication from a well-known and successful veterinary surgeon of this city upon the nature and symptoms of the disease, together with the recommendations in regard to its treatment:

In accordance with a request I give you some of the symptoms which characterise the epizootic that has just made its appearance, and is vigorously at work victimising the horses of this city, with some suggestions in regard to the proper care and treatment of the disease during its course.

I think it cannot properly be regarded as a new disease. It is clearly a form of influenza that has occurred frequently in the United States, as it often has in different portions of Europe. Three forms of influenza are spoken of by veterinary authors: the catarrhal, rheumatic, and the gastro-erysipelatous form.

Treatment.—The patient should be excused from all labour and allowed complete rest. The stables should be cleanly and well ventilated. Disinfectants may be useful, and in some stables necessary. Any of the following will answer: Carbolic acid, sulphate of iron, or bromo-chloralum. The patient should be properly groomed, and the nose and eyes frequently sponged with water, and the limbs, if cold, bandaged. The drink should have the chill slightly removed, but not enough to make it warm and unpalatable. The diet should be light and of a laxative nature; say spout feed or

bran, wetted or scalded, with a little salt added. Hay in limited quantities may be allowed.

In regard to remedies, I wish to say that heroic treatment should not be tolerated. Bloodletting, cathartic nauseants, and arterial sedatives, are, all of them, either injurious or uncalled for. Next, whatever medicines are administered should not be given in the form of draughts or drenches, as the animal is sure to be thrown into a paroxysm of coughing the moment the drench is attempted, and some of the medicine will, in such event, be almost sure to find its way into the windpipe and bronchial tubes, thus inducing fatal bronchitis or pneumonia. Balls should not be given, as they will be coughed back or out, and the irritability of the throat will be increased in attempting to pass them over with the hand or fingers. Powders are well-nigh useless, as when mixed with the food the patient will usually refuse both food and powders. Electuaries, syrups, or pastes, are the only forms in which medicines may be safely and successfully administered in cases where the throat is tender and irritable, and coughing easily induced.

Saline medicines I regard as the most useful in this disease. Any of the following will answer: Chlorate of potash, muriate of ammonia, or hyposulphate of soda. As an anodyne to relieve the cough, fluid extract of belladonna may be added. The proper dose of either of these medicines may be rubbed up with two or three ounces of honey or molasses, and these poured in the mouth from a small bottle, or placed on the tongue with a spoon. Given in this way the medicines will be readily lapped up and easily swallowed. But little trouble is required to give it, and no danger of getting any medicine in the trachea will be incurred by this method. About the throat and over the windpipe a sharp stimulating liniment should be well rubbed in. In cases that prove severe, or are complicated with other and more serious diseases, a competent veterinarian should be employed.

The epidemic struck Rochester about the first of last week, and it has spread with astonishing rapidity. It is supposed that seven tenths of the horses in the city are more or less affected by this epidemic.

The source of the disease, as we have before stated, was in Canada, where it has raged with peculiar virulence, and its ravages have by no means abated. In Toronto, while this epidemic was at its height, it was almost impossible to secure a horse for any purpose; the street railroads were obliged to suspend operations; carriages, both public and

private, cabs, trucks, and, in fact, all vehicles moved by horse-power, were in the same predicament. The disease first made its appearance on this side of the river on Friday, October 11th, at Niagara Falls.

What the Disease is, and how it should be Treated.

Dr. E. Mink, in *Rochester Express*, October 21st, says:

I think it cannot be properly regarded as a new disease. It is clearly a form of influenza that has occurred frequently, in the United States, as it often has in different portions of Europe. Three forms of influenza are spoken of by veterinary authors—the catarrhal, rheumatic, and the gastroerysipelatous form.

The disease which is now seizing so generally the horses of this city is plainly of a catarrhal character. The first noticeable symptoms will be a flow of tears from the eyes, a watery discharge from the nose, and general languor. Next a cough, which, becoming more frequent, will soon occur in paroxysms. In the commencement the membranes of the nose will be found pale, or of a leaden colour, and those of the eyes presenting a yellowish or reddened appearance. Many cases are ushered on with a chill. All this soon succeeded by a general feverish condition, manifested by heat of mouth, membranes of the eyes and nose reddened, pulse frequent, though soft and easily compressed, respiration quickened and sometimes laborious. At this stage the bowels may be sluggish, urinary organs inactive, and the discharge from the nose often assumes a yellowish or greenish appearance.

The disease usually runs its course within ten days, and with proper treatment few, if any, cases ought to prove fatal. Those that do so are usually complicated with other diseases, as bronchitis or pneumonia.

[Here follows a reprint of the treatment, reported at page 951 *et seq.*]

CENTRAL VETERINARY MEDICAL SOCIETY.

The usual monthly meeting of the above society was held Thursday, November 7th, at 10, Red Lion Square, the President, F. J. Mavor, Esq., in the chair.

There were present 21 fellows and 2 visitors.

The President addressed the meeting at some length, thanking them for having elected him to the office, and paying a justly earned tribute to the retiring president. In the course of his remarks he dwelt on the subjects which he hoped the society would discuss, referring to the preservation of living marine animals in aquaria; hypodermic injection, and its influence in enteritis, rheumatism, muscular and nervous affections; the physiological action of drugs, and the use of the microscope.

Mr. W. Clark (London) introduced a specimen of disease of the teeth and alveolar sockets; the subject, a five-year-old entire horse, was noticed shortly after purchase to be addicted to quidding; he lost flesh rapidly, and finally succumbed to an attack of colic. On *post-mortem* examination caries of the walls of the alveoli of the posterior molars was detected, and also an osseous enlargement inferiorly situated.

Mr. J. B. Martin (Rochester) produced a specimen of diseased œsophagus. The subject from which the specimen was taken was a cart-horse in low condition, and from the indications, frothing at the mouth and other symptoms, Mr. Martin concluded the teeth were affected, but after the animal was destroyed an examination showed the teeth to be sound; there was, however, considerable enlargement and muscular hypertrophy of the lower portion of the œsophagus, as if from previous impaction.

Mr. W. Hunting (London) was then called upon to read his paper on roaring, in introducing which the essayist stated his sense of the obscurity of the term roaring, which conveyed no idea of the structural changes in the larynx or trachea. He said that if sufficient space existed for the passage of air the local mischief might continue, jeopardising the animal's life or comfort; therefore, as a radical cure was not possible, he would call attention to a possible means of relieving, not the disease, but its effects on respiration. He described two forms of roaring, one resulting from disease of the larynx, and the other consequent on some disease of the small air-passages. Among the causes referred to were the use of the bearing rein, paralysis of the left crico-arytenoid muscle from inflammation of the laryngeal membrane, and derangement of the motor nerve. The influence of castration on entire horses so affected was referred to. Mr. Hunting also stated his belief that all affected horses were narrow chested. The commoner forms of treatment and their effects were touched on, and an operation not much known or adopted was described. The operation, which is only effectual in cases which are due to paralysis of the crico-arytenoid muscle, consists in removal of the obstructing cartilage. Paralysis of the arytenoid muscle leaves one side of the glottis and one arytenoid cartilage passive, so that

inspiration is accompanied by a dilatation of only one side of the glottis, the constriction occurring to the extent of the size of the cartilage. In the operation the horse is secured on his back, with the nose stretched out as far as possible, so as to render the skin tense and smooth over the larynx. In this position the cricoid ligament connecting the cricoid cartilage with the first ring of the trachea is extended to its full length, and a longitudinal incision is made in it, exposing the arytenoid cartilage. If on inspection one of them is found to be active, the other passive, the latter is to be grasped by a hook and then cut short off with a curved probe-pointed bistoury. The wound is treated simply, and scarcely any blemish results. Mr. Hunting quoted an instance of the operation which he witnessed, and it was successful.

Mr. Field, jun. (London), said the operation was simple enough, but in three cases in which he had resorted to it no beneficial results had accrued. The ulterior results most to be feared were granulations from the sides of the wounded cartilage.

Mr. Wragg (London) asked if climate had any influence in the production of roaring, as he understood that it was unknown in Australia. His statement was negatived by *Mr. Fursden* (a visitor), who had driven a roarer when at Melbourne.

Mr. Burrell knew of horses that were altogether incapable of work from being affected with roaring. He considered the disease to be due to long-continued excitation of the muscles of the larynx, in some cases associated with temporary derangement of the heart's action. He quoted an instance of its sudden appearance in a horse which was worked three days after a sudden fall in a mews.

Mr. A. Mavor considered that the whole respiratory system was implicated in the disease.

Mr. Hunting, in reviewing the observations made, remarked on the circumstances under which we meet with cases of roaring, they being more frequently noticed in making examinations for soundness than in the treatment of disease. He related a case which was due to a pedunculated tumour in the larynx. Referring to the operation described in his paper, he stated that the subject which he had seen operated on died, and it was found that the membrane of the larynx was thickened, and by accident the vocal cord had been divided, thus further enlarging the passage.

The President, in concluding, observed that if both cartilages were removed there would be a risk of the horse being choked, in consequence of the passage of food into the trachea; at the same time he thought that the removal of one could hardly alter the noise.

The President announced that the ballot which had been taken during the evening for the election of Captain Benjamin Russell

was unanimously in his favour; and stated that Messrs. Shaw, of Hackney, and Stanton, of Hornsey, were proposed as Fellows.

The meeting then adjourned.

JAMES ROWE, jun., *Hon. Sec.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE concluding quarterly meeting for the current year was held at the Queen's Hotel, Leeds, on Thursday, the 31st Oct., the President, Mr. John Cuthbert, in the chair.

The following members were also present, viz.—Messrs. Greaves, Naylor, Freeman, Nicholson, Anderton, Carter, Pallding, Walker, Fearnley, Ferguson, and the Secretary.

Apologies for non-attendance were received from Messrs. Dray, McTaggart, John Schofield, Josh. Freeman, John Freeman, and Patterson.

After the usual preliminary business had been transacted Mr. Jas. H. Ferguson read an able and practical paper on "Shoeing," which elicited a spirited and profitable discussion, in which Messrs. Greaves, Naylor, Freeman, Nicholson, Fearnley, Carter, Ferguson, and the President, took part. At the finish of the debate the following motion was unanimously agreed to, viz. —"That in the opinion of this meeting all veterinary surgeons should be able to remove a horse's shoe, pare out the foot, and examine it thoroughly; also to replace the shoe when necessary."

The election of office-bearers for 1873 resulted as follows:— President: Mr. Joseph Shepherd Carter. Vice-Presidents: Mr. Cuthbert, Mr. Day, and Mr. Greaves. Secretary: Mr. Broughton. Treasurer: Mr. Fearnley.

Mr. Greaves proposed, and *Mr. Freeman* seconded, a vote of thanks to the retiring President for the very able and courteous manner in which he had conducted the business of the Society during the year.

Carried with acclamation.

Mr. Cuthbert returned thanks, and remarked that he thought the papers read before the members during the year, and the discussions thereon, were quite up to the standard of those of any former period.

An excellent repast, at the expense of the Leeds members, concluded the proceedings.

W. BROUGHTON, *Hon. Sec.*

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

The thirty-fourth quarterly (annual) meeting of the above Association was held in the Medical Hall, Hope Street, on Friday evening, the 8th November, 1872.

After tea the chair was taken by the President, James Storrar, Esq. There were also present Messrs. Morgan, Reynolds, Kenny, Jos. and W. Leather, G. Heyes, and C. Elam, of Liverpool; Dobie, Birkenhead; Welsby, West Derby; T. Greaves, Manchester; Whittle, Worsley; Woods, Wigan; Barnes, Malpas; and the Secretary.

Visitors, George Watson and James Brettle.

Mr. Reynolds proposed that Messrs. G. Fleming, Royal Engineers, and T. D. Broad, of Bath, be elected honorary associates, on the grounds stated in Clause 1st, in Rule XIII of the Association.

The proposal was seconded by *Mr. Heyes*. Each was separately and unanimously elected.

Letters of apology were read from Messrs. W. Carless, A. Cartwright, E. Nuttall, James Lowe, and Professor Walley. The latter enclosed particulars of a case of lameness affecting the muscles of the thigh, the leading symptoms of which were atrophy of the *vasti*, *rectus*, and *tensor vagina* muscles, giving rise to unusual prominence of the patella, helpless flexion of the limb, and excessive drooping of the quarters, adding to the difficulty of forming a correct diagnosis. Professor Walley had previously seen similar cases. The first of these cases was diagnosed by several veterinary surgeons to be one of fractured tibia.

Proposed and seconded by *Messrs. Storrar* and *Woods*, "That a vote of thanks be forwarded to Professor Walley for his interesting communication."

The Treasurer's and Secretary's reports were read. The President also read a short address; after which

Mr. Morgan proposed a vote of thanks to the retiring officers for their past services, which was seconded by *Mr. Heyes*, and carried with acclamation.

The office-bearers having briefly returned thanks, the following gentlemen were unanimously elected for the ensuing year:

Mr. R. S. Reynolds, President; Messrs. Storrar, Welsby, and Elam, Vice-Presidents; Mr. Woods was re-elected Treasurer; and Mr. Kenny, Secretary.

Mr. Greaves introduced, extemporaneously, the subject of the American epidemic among the horses, which was very generally thought to be nothing more than a severe type of influenza.

WILLIAM C. LAWSON, *Hon. Sec.*

GLASGOW VETERINARY COLLEGE.

THE duties of the winter session commenced yesterday. Dr. Moffat delivered the introductory address, and referred to the inauguration of the summer session as a new feature in the rules of the College. It was remarked, as indicating the steady advance of the College, that a much larger number of students have already enrolled than in any previous session. The latter part of Dr. Moffat's lecture bore upon "The chemical relations of the plant, the soil, and the animal," and was listened to by a large audience, entirely filling the lecture hall. Among the gentlemen present were—Mr. Yura and Mr. Euajama, of the Japanese Embassy; Professors Thompson and Young, Glasgow University; Drs. Lyon, Knox, and Stirton; and Messrs. Newlands, Pottes, Young, Anderson, Steel, &c., &c., veterinary surgeons. At the close of the lecture—

Mr. Yura, through Mr. Euajama, expressed the pleasure he experienced in being present and witnessing so many interesting experiments, and he hoped the College would continue to be more and more appreciated.

Professor Thompson, in proposing a vote of thanks to the Principal, stated that he was delighted to learn that a summer session had been added to the course of studies. He and his brother professors took a deep interest in veterinary science, and in the prosperity of the institution founded and so ably conducted by Professor M'Call, and he hoped that the connection betwixt the University and the Veterinary College would become more intimate.—*Glasgow Herald.*

ORDER IN COUNCIL.

AT the Council Chamber, Whitehall, the 5th Day of November, 1872.

PRESENT:—Mr. Goschen. Mr. Forster.

The Lords and others of Her Majesty's Most Honorable Privy Council in virtue and in exercise of the powers in them vested

under The Contagious Diseases (Animals) Act, 1869, (in this Order referred to as the Act of 1869,) and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :—

1. Words in this Order have the same meaning as in the Act of 1869.

2. Where a Local Authority is authorised by the Privy Council to slaughter cattle that have been in contact with cattle affected with pleuro-pneumonia, such Local Authority may cause all cattle that have within thirty days been in contact with cattle affected with pleuro-pneumonia within their district to be slaughtered, subject to the following provisions :—

(1.) The owner of any animal so slaughtered may either dispose of the carcase on his own account, with a license from some officer appointed in that behalf by the Local Authority, or may require the Local Authority to dispose of the same, in which latter case the Local Authority shall, by way of compensation for every such animal, pay to the owner thereof such sum, not exceeding thirty pounds, as may equal three-fourths of the value of the animal slaughtered.

(2.) The Local Authority may require the value of any such animal to be ascertained by their officers, or by arbitration, and generally they may impose conditions as to evidence of the slaughter and value of any such animal.

3. The expenditure of a Local Authority in pursuance of this Order in respect of compensation shall be defrayed out of the Local Rate.

4. Where the Local Authority in pursuance of this Order cause any cattle to be slaughtered, the owner thereof shall not be entitled to recover in respect of the insurance thereof any sum which, together with the payment which he receives for the same under this Order, would exceed the sum which he would have been entitled to receive in respect of the insurance.

5. Every Local Authority shall keep, in such manner and form as the Privy Council from time to time direct or approve, a record, stating the date of any order made by them for slaughter under this Order, and the execution of the order, and other proper particulars ; and such record shall be evidence if any question arises concerning an order for the slaughter of any such animal, or concerning compensation in respect thereof.

(Signed) Edmund Harrison.

Veterinary Jurisprudence.

TAMWORTH COUNTY COURT.—November 15th.

Before W. H. Cole, Esq., *Judge*.

HORSE WARRANTY CASE.—"SPAVINS OR NO SPAVINS."

BULLING *v.* FRITCHE AND PRINCEP.

The plaintiff, Thomas William Bulling, gentleman, of Toft Hill, Dunchurch, near Rugby, sought to recover from the defendants, the Rev. George Cheslyn Fritche, Rector of Newton Regis, and John Princep, of Appleby, gentleman, the sum of £13 9*s*., for loss sustained in the alleged wrong warranty of a pony.

Mr. R. H. Palmer, of the Norfolk Circuit (instructed by Mr. Dainty, of Rugby), appeared for the plaintiff, and Mr. R. W. Nevill, for defendants.

This was a special jury case.

Mr. Palmer, in his opening remarks, commented on a voluminous correspondence between the parties concerned, relating to the transaction in dispute, and then examined the plaintiff, Mr. Thomas Stanley, veterinary surgeon, of Leamington, Mr. W. Bindley, auctioneer, and Mr. F. Warwick. From the evidence adduced it appeared that Mr. Bulling wanting to buy a pony in May last, mentioned the matter to Mr. Princep, who referred him to the Rev. G. C. Fritche, who had a chestnut pony, thirteen hands high and five years old, which he wanted to part with on account of its being too small for his requirements. He came over to Tamworth and examined the pony; negotiations were entered into, and a bargain was eventually struck at £35. On the 5th June the pony was forwarded to plaintiff by rail, *viâ* Rugby, and placed in his stables. It had a slight cough, and a discharge from the nostrils, and next morning Mr. Stanley examined the animal, and pronounced it to be suffering from bone spavins in the hocks, the off one being the worst. He therefore advised plaintiff to procure a warranty, and Mr. Fritche was written to. In reply he sent a warranty signed by himself and Mr. Princep, "that the pony was warranted sound and quiet in harness." A cheque for the £35 was then sent, but plaintiff alleged the pony did not improve after a month's work, and on the 1st July Mr. Stanley found it lame and suffering from bone spavin of long standing.

On the 12th the pony was returned and kept a fortnight in the "Tweeddale Arms" stables, Mr. Fritche refusing to receive it or return the money. Mr. Princep advised Mr. Fritche to take this course, and, in a letter to plaintiff, told him he was ready to meet him in any court of law. On the 27th July the pony was sold by Mr. Bindley in Tamworth market for £27 6*s.*, Mr. F. Warwick purchasing it for his brother, the celebrated coursing judge. Mr. Brindley, in his evidence, said he noticed no unsoundness, and Mr. Warwick gave a similar opinion, saying he thought the pony sound or he would not have purchased it. He sold it to his brother for thirty guineas, and it was sound still; but he would not like to give an opinion as to whether it had bone spavin or not. The pony was sold for £27 6*s.*, and the expenses amounted to £5 15*s.*, reducing the value to £21 11*s.* The difference between the latter amount and the £35 originally paid was £13 9*s.*, a sum the present action was brought to recover.

For the defence Mr. Nevill reviewed the case in a thoroughly exhaustive speech, and pointed to the fact that the pony had been in Mr. Fritche's possession three years, and had never suffered from lameness. The pony he contended was perfectly sound when sent to Mr. Bulling, and its being sold afterwards in open market and realising twenty-six guineas showed there could not have been much the matter with him. He scouted the idea of unfair dealing, for it was well known that Mr. Fritche was incapable of acting in a manner unbecoming the character of a gentleman; and from the beginning Mr. Princep had merely acted as a friend by introducing the plaintiff to Mr. Fritche, he not having the slightest interest whatever in the transaction. After hearing his witnesses he should await with confidence a verdict in his favour at the hands of the jury.

The Rev. G. C. Fritche and Mr. Princep were examined and gave evidence to the above effect.

Mr. Thomas Gaved, of the firm of Cunningham and Gaved, veterinary surgeons, of Burton-on-Trent, said in May last he thoroughly examined the pony with a view of purchasing it, and found it perfectly sound, and not affected with spavin.

Mr. Harry Olver, M.R.C.V.S., said he attended the pony twelve months ago for a cough, and it got well. He professionally examined it three months ago and again two days before it was sold to plaintiff, and passed it as perfectly sound. The hocks were sound and had not the slightest indication of spavin. Had there been such he must have detected it.

Mr. Palmer having replied on the whole case,

His Honour carefully summed up the evidence, and told the jury the only point of evidence to be considered was that bearing

on the soundness of the pony. He pointed to the testimony of the veterinary surgeons on both sides, and remarked that he quite believed Mr. Fritche had acted in perfect good faith throughout. The question at issue was merely one of opinion, which he must leave for the jury to decide.

After an absence of a quarter of an hour the jury returned and gave a verdict for the defendants, with costs.—*Tamworth Herald.*

CRUELTY TO ANIMALS.

An Edinburgh cattle salesman, named John Martin, was yesterday, Nov. 19th, fined by the Oxford magistrates £10 and costs for cruelty to cattle. Defendant had sent ten cows from Kilmarnock to Oxford, the journey occupying thirty-five hours, without providing food and water. The prosecution was instituted by the Royal Society for the Prevention of Cruelty to Animals.—*Echo.*

OBITUARY.

We have to record the death of Mr. Thos. Shenton, M.R.C.V.S., Bakewell, Derbyshire. His diploma bears date April 24th, 1850.

Also, under very melancholy circumstances, of Mr. D. B. Howell, Reading. His diploma bears date May 4th, 1860.

Likewise, on Nov. 15th, at Copthorn, Surrey, of Mr. William Haycock, M.R.C.V.S., Strangeways, Manchester, aged 54. His diploma bears date April 20th, 1842, and

Recently, of Mr. William Attfield, M.R.C.V.S., Guildford, Surrey. His diploma bears date January 13th, 1810.

To the above we regret to add the death of Mr. Charles Dickens, M.R.C.V.S., Kimbolton, which took place on Nov. 18th, in the 68th year of his age. Mr. Dickens' diploma bears date July 12th, 1830. A few years since he was compelled by the state of his health to retire from all active duties of the profession, at which time he held office as a member of the Council of the Royal College of Veterinary Surgeons.

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